

NOVITATES ZOOLOGICAE.

Vol. II.

AUGUST, 1895.

No. 3.

A REVISION OF THE *PAPILIOS* OF THE EASTERN HEMISPHERE, EXCLUSIVE OF AFRICA.

By THE HON. WALTER ROTHSCHILD.

WHEN I first began the investigations which form the foundation of this article, I had intended to give a revision and bibliographical and synonymical list of the *Rhopalocera* of all the islands east of "Wallace's Line," which passes between the islands of Bali and Lombok.

This revision would have been founded, as is to a great extent the present one, on the collections made in the Indo- and Austro-Malayan regions by the celebrated American collector Mr. William Doherty.

However, when I came to work out some of Mr. Doherty's large and magnificent collections, I was very much startled to find that the synonymy and bibliography of the Lepidoptera were so involved and so full of errors, that a complete and in all respects scientific revision of the *Rhopalocera* of these numerous islands would necessitate more or less a complete reference to the *Rhopalocera* of the whole of the old world. I therefore gave up my idea, and determined to give a series of monographic revisions, dealing with a few families both of *Rhopalocera* and *Heterocera* from the whole world, and only in such cases where I either possess one of the best collections of these families, or am particularly interested in such families. In each case the revision or series of revisions of the species belonging to a family will be followed by a final generic revision.

In the present as well as in all future revisions, scrupulous attention has and will be given not only to the synonymy and bibliography, but to the structure, venation, scaling, scent-organs, etc., so as to base the final generic revision on as *wild* a basis as possible.

I had hoped when I began this paper to carry out all the necessary investigations and examinations of material myself; but as the work proceeded I found that it involved such a vast amount of time that I was obliged to call in the help of Dr. Jordan, the Entomologist of the Tring Museum.

Dr. Jordan has gone through the bibliography for me, and also has visited, both together with me and alone, the collections of the British Museum, Messrs. Salvin and Godman, Mr. H. Grose Smith, Mr. Herbert W. Adams, Mr. Crowley, and others; and if it had not been for his help and care, I am afraid many years would have gone by before I could have even attempted to carry out this work.

Throughout the work will be found a number of notes by Dr. Jordan, dealing with our methods of investigation, such new or unfamiliar facts as have presented themselves to us, and, lastly, detailing the scope of the present article.

I must here express my grateful thanks to all those who have so generously assisted me, both with their knowledge and by placing their collections at my disposal. Besides those mentioned above, I must also express my thanks to Mr. C. Oberthür, Mr. J. Röber, Dr. Otto Staudinger, and many others for most invaluable help.

The delimitation and definition of genera can only be carried out by the study and comparison of the whole of the species of a family from every part of the globe; therefore in this article I have merely divided the species into preliminary groups, many of which may however be the foundation of corresponding genera, to be defined in my final paper. As I have not in this article separated the genera, it will no doubt strike some people that, although I am such a strong advocate for strict priority and synonymy, I have contradicted myself by leaving several species of *Papilio* under the same specific name: this is, however, only done with a view of simplifying my future work; for all these cases will finally right themselves when the species come to be separated and enumerated under their proper generic designations. I have in this article made one exception in regard to the group of *Papilios* known universally under the generic name of *Ornithoptera*; this I have done more for the sake of the general entomologist than from a justifiable scientific reason. I have, however, treated them under the head of *Troides*, a genus of Hübnér's which has the priority over Boisduval's *Ornithoptera* by a number of years.

INTRODUCTORY NOTES.—The principal object of this revision is to identify the hitherto described Eastern *Papilios* and to delimitate the species, not to give detailed descriptions of the insects dealt with, which would be the object of a monograph. As the results of our investigations often differ from those of other entomologists, it is necessary to give a short account of the method of our researches, the means upon which they are based, and of our views with regard to nomenclature and variation of the *Papilios*.

Anybody who first makes the acquaintance of the numerous Eastern *Papilios* will be startled not only with the relatively enormous number of different forms, but especially with the great inconstancy of those characters by which the so-called "species" used to be and are distinguished. He will be greatly astonished at the extensive variability of the shape and pattern of the wings. When I began to study the *Papilios* more closely under Mr. Walter Rothschild's guidance, I was indeed first inclined to think that a revision of these confusingly variable insects could hardly be more than an unsuccessful attempt at identifying and classifying the "species" and "varieties," and of enumerating the more or less correctly identified forms in a manner similar to that carried out by the Felders in 1864. But as we soon found that most of the mistakes in the articles dealing with the butterflies of the Indo-Australian Regions occurred in consequence of the respective authors having worked with too small a material, or not having compared carefully the descriptions of the older writers, or not having been able to identify Felder's "species," we became convinced that many of the errors could be avoided with the help of long series of specimens, a good library, and the Felderian types.

Notwithstanding that the Tring Museum contains of most species greater numbers of specimens than entomologists usually keep in their collections, and though we have compared the examples in the collections of the gentlemen named above, the material examined by us is in some cases still quite insufficient for the purposes of this paper. Specimens without or with "dealer's" locality are worthless for our

investigations, and it is also not enough to have fifty or more individuals of a species from a certain place; but it is most important to have the insect in numbers from every district where it occurs. This, however, is impossible for the present, as there are still many unexplored localities in the East, and many districts where only a limited material has been collected. Central Nepal (which is probably inhabited by races of *Papilios* standing intermediate between those from North-West India and Cashmere on the one side, and those from Sikkin and Assam on the other), the northern slopes of the Himalaya, Southern and Eastern Tibet, the highlands of Formosa, the mountains of Palawan, Mindanao, E. Celebes, Flores, Timor, etc., the island of Obi, several of the lesser Sunda Islands, the Charles Louis and Albert Victor Ranges in New Guinea, the Admiralty Islands, the islands of Bongainville, Choisenl, Isabel, the Santa Cruz Islands, and so forth, are practically unknown to entomologists, and will certainly provide us with many new forms of *Papilios*. And even in countries better known than those above enumerated there still exist undiscovered *Papilios*, as well as many of such rarity that only one or a few specimens are known: the types of *P. walkeri* Janson from S. India, *P. nobilus* Stauding. from N. Borneo, *P. prillwitzii* Fruhst. from Java, and others are unique; of *P. sikontala* Hew. from N. India, *P. noblei* Nicév. from Burma, *P. caunus* Westw. from Java, etc., scarcely three examples have been recorded.

It is therefore not to be wondered at that in certain cases the required large material could not be obtained, and that the work had to proceed without it.*

The incompleteness of our knowledge of the Indo-Australian fauna does, however, much less affect the identification of the hitherto described forms than the views in respect to the relationship of the species and races. Many of the new *Papilios* to be discovered in future will doubtless turn out to connect some of the insects which now appear to us specifically distinct; others may combine the characters of two groups or genera, and a material more carefully collected in respect to season and exact locality, and especially more carefully labelled in the collections, will often prove that some of the varieties which a *Papilio* produces in a certain district, and which we look upon as being mere individual aberrations, are, in fact, seasonal forms, or localised races restricted to places offering altered conditions of life, such as mountains, swamps, etc.; so that further discoveries will alter much more the classification of the *Papilionidae* than the names of the *Papilios*. There are two species—*P. amphitrión* Cram. and *P. lacedemon* Fabr.—of which, to our knowledge, no specimens exist in collections. These species may be based upon painted up or otherwise mutilated individuals, and are treated in this paper with a (?); but they may just as well be rediscovered some day, and then will probably affect the nomenclature to a certain extent, as *P. amphitrión* Cram. has the priority over *P. gambrisius* Cram., and *P. lacedemon* Fabr. over *P. clytia lankeswara* (Moore).

Montronzier's species described from Woodlark Island are also practically unknown to science. The descriptions, though quite sufficient for the time they appeared (1856), are not exhaustive enough to enable us to decide whether the Woodlarkian species are different from the forms inhabiting New Guinea and the neighbouring groups of islands. The Woodlark *Papilios* are therefore simply enumerated under the names bestowed upon them by Montronzier (Montronzier's

* We call the special attention of the reader to this weak point of the revision, and should feel obliged if one or the other of our readers who is in possession of a good material would criticise this paper and publish the errors he might find, or communicate directly with us about query points.

“*Ornithoptera boisduvali*, *Papilio duvali*, *telemachus*”), or are treated as synonyms or query synonyms of the New Guinean insects (Montrouzier’s “*Papilio armenus*, *severus*, *godarti*, *aegistus*, *sarpedon*, *codrus*”).

Besides these species or varieties, we have not seen any specimen of the following forms. As most of them have been figured, we could decide whether they are identical or not with insects known under other names, exclusive of Hagen’s *ab. fuscus*. These species and varieties are :—

1. *Troides priamus poseidon* *ab. goliath* (Oberth.) ; known to us from the figure and a photograph.
2. *Troides helena* *ab. jupiter* (Oberth.) ; known from the figure.
3. *Troides amphrysus sumatranus* (Hagen) ; known from the description only.
4. *Papilio mariae almae* Semper ; known from the figure.
5. *Papilio annae phlegon* Feld. ; known from the figure.
6. *Papilio doubledayi sambilanga* Doherty ; known from the description.
7. *Papilio crassipes* Oberth. ; known from the figure.
8. *Papilio noblei* Nicév. ; known from the figure.
9. *Papilio nerilli* Elwes & Nicév. ; known from the figure.
10. *Papilio paradoxus telesicles* *ab. fuscus* Hagen ; known from the description.
11. *Papilio neumoegei* Hour. ; known from the figure.
12. *Papilio montrouzieri* *ab. westwoodi* Oberth. ; known from the figure.
13. *Papilio lorquinianus albertisi* Oberth. ; known from the figure.
14. *Papilio peranthus intermedius* Snell. ; known from the description and some notes *in litteris*.
15. *Papilio prillwitzii* Fruhst. ; known from a photograph.
16. *Papilio podalirius* Oberth. ; known from the figure.
17. *Papilio eurypylus saugivus* Oberth. ; known from the figure.

All the other Eastern *Papilios* are either contained in the Tring Museum, or we could examine them in other collections.

In order to show to the reader what material stands at the present time at our disposal in the Tring Museum, and to provide ourselves with a kind of catalogue which shows at once the desiderata of the Tring Museum, we have given, in brackets after each locality, the numbers of specimens of each species and sub-species contained in Mr. Rothschild’s collection from every locality. I expressly add that in most cases we also had the opportunity to examine specimens from such places from where the Tring Museum does not yet possess the respective insects.

A careful identification of so numerous and difficult a group of forms of insects as we have had to deal with in this revision can only be carried out if one abandons all prejudices, if one takes none of the names by which one is accustomed to call certain forms for granted, and begins with the very beginning, starting in every case from the first mentioning of the insect in the zoological literature. The oldest writers upon Natural History objects, Aristoteles, Plinius, Albertus Magnus, and others, up to the end of the sixteenth century, need scarcely be taken into consideration.

The first figure of a *Papilio*, to my knowledge, is that in Hoenfagel’s *Archetypa* (1592), where we find *P. machaon* L. and *P. podalirius* L. represented on plates 11 and 12 of Part III. In the course of the seventeenth century and at the beginning of the eighteenth, there appeared a good many works, of Aldrovandus, Hollar, Monfret, Merret, Jonston, Petiver, Rajus, etc., in which

the European *P. machaon* and *podalirius* are described or figured, and in these books we find also the first accounts of Exotic Papilios : Petiver, for example, figures *P. rumanzovius* Eschsch. as "*Papilio luzovicus maximus*," etc. Petiver and Rajus describe *P. lector* L.

While the knowledge of the American Lepidoptera increased much in consequence of the appearance of Madame Merian's *Metamorphosis Insectorum Surinamensium* (1705), only a few Eastern Papilios became known until Linné's *Systema Naturae*. In the tenth edition (1758) of this work, Linné adopted, for the first time, regulated nomenclature for all classes of animals : he carried out the binomial system of nomenclature throughout the animal kingdom, EXCEPT IN LEPIDOPTERA. It is very curious that Linné abandoned his binomial system when treating the Lepidoptera in *Systema Naturae*, and designated these insects with three names (*Papilio Eques Priamus*, *Papilio Danaus Midamus*, etc.), indicating with the first name the genus, with the second a section of the genus (a "*phalanx*"), and with the third the species. The name of the subsection (*Trojanus* [*Tros*=*Trois*], *Achivus*, *Festivus*, *Ruralis*, etc.) is not added to those of the genus, section, and species in *Systema Naturae* ; but subsequent authors have also done this (*Papilio Eques Trojanus Priamus*), so that the entomologists of the second half of the last century had not a bi-, but a tri- or quadrinomial nomenclature. The consequence of this superfluity of names for a butterfly or a moth was that some authors, like Cramer, contented themselves with one name, the specific name, and called their Lepidoptera simply *Priamus*, *Midamus*, *Helena*, etc., a system which is still high in favour among many collectors of European Lepidoptera.

As the tenth edition of *Systema Naturae* has been accepted by zoologists as the starting-point of nomenclature, chiefly because Linné carried out in 1758 the binomial nomenclature throughout ALL classes of animals, we must remark that this does not apply to Lepidoptera ; and if one abandons the pre-Linnean names and the Linnean names in the first to ninth editions of *Systema Naturae* by reason of their not being in accordance with the rules of binomial nomenclature, we ought logically to begin with later authors (Douvan, Latreille, etc.), not with Linné. As, however, Linné designated the Rhopalocera and Sphingidae with two names in *Fauna Suecica*, *Amoenitates*, etc. (*Papilio Machaon*, *Papilio Polydorus*, *Papilio Aegisthus*, etc.), and gave also only two names to the Sphingidae in *Systema Naturae* ed. x., it is clear enough that Linné's trinomial system has as basis the binomial one, and is nothing else but the trinomial system adopted by many modern authors who put the name of a "subgenus" in brackets between the generic and specific terms. The relatively great number of Lepidoptera which Linné described did not furnish him with many characters which he thought of generic value, and could therefore be divided only into a very limited number of genera (*Papilio*, *Sphinx*, *Phalaena*). Linné erected (1758), for example, 22 genera for 594 species of Coleoptera, and only 3 genera for 535 species of Lepidoptera. The genera *Papilio*, *Sphinx*, and *Phalaena* contained each so many species that a division into "*Phalanges*" was necessary : and in order to indicate the closer relationship of a species, Linné added the name of the "*Phalanx*" or "*Section*" or "*Subgenus*" to those of the genus and species of *Papilio* and *Phalaena*, just as Messrs. Elwes, de Nicéville, Semper, and other reliable authors are accustomed to do at the present time, with the exception that Linné did not put the additional name in unnecessary brackets. If one takes this point of view, as we do, one must accept the Linnean names, and, as in the works published before 1758 no regulated nomenclature has been applied,

can neglect those names which the insects have received before the tenth edition of *Systema Naturæ* (1758).*

Linné received a great many of his insects from Holland, and that explains how it came that so many Linnean species are forms inhabiting the old Dutch colonies Surinam, Cape Colony, and Amboina.

The greatest part of the species shortly diagnosed in *Systema Naturæ*, ed. x., have been more fully redescribed in *Mus. Lud. Utr.* (1764), and an excellent revision of the species of this latter work, based especially upon an unpublished manuscript of Linné and a good number of Linnean specimens, has been given by Professor Dr. Christopher Aurivillius in 1882 (*Reconsio Critica Lepidopterorum Musci Ludovicæ Ultricæ quæ descripsit Carolus a Linné in Kongl. Sc. Vet. Ak. Handl.* XIX. 5). Though we agree in most points with Aurivillius' explanations, we come nevertheless in some cases to other conclusions, the reasons of which are given under the respective species: so we treat the Aurivillian *P. panthous* L. as *T. hypolitus* (Cram.), *P. helena* L. as *T. oblongomaculatus* (Goeze), *P. erithonius* Cram. as *P. demoleus* (L.).

Some of the Linnean species of 1758 are undoubtedly described from figures, not from specimens (*P. E. helena*, for example), and in such cases we have to rely upon the figure and the accompanying notes of the quoted author.

A great help in identifying the Linnean Papilios are Clerck's *Icones Insectorum* (1764), part of the figures in this work, which we have compared at the library of the British Museum, being taken from specimens in the Museum of the Queen Ludovica Ulrica, and it is on the whole not so difficult to apply the Linnean names to the right species of Papilio, though it remains sometimes rather doubtful which special local race of a species Linné had before him (see p. 182).

Shortly after Linné's *Mus. Lud. Utr.* the *Thesaurus* of Seba came out (1765), in which a great many Amboina Lepidoptera are figured. The figures of Seba cannot boast of being correct: nevertheless one can recognise the Papilios pretty well, and must, therefore, accept the names proposed for them by Goeze. *Ent. Beytr.*, in 1779, so far as these species do not have older names. Goeze's *Papilio fuscus* has the priority over Cramer's *P. severus*, *P. castaneus* Goeze over *P. pertinax* Wallace.

The post-Cramerian authors, Jablonsky, Herbst, and Esper, characterised only a few new Papilios, of which the *P. pandarus* Jablonsky (*nee* Linné) = *P. pseudo-pandarus* Esper is a *spec. fict.* The text of Esper's *Ausländische Schmetterlinge* contains many useful remarks about the identification of certain Linnean species.

Of the Fabrician species some are not recognisable (*P. pompilius*, *P. orestes*), another is undoubtedly based upon a mutilated specimen (*P. astyanax*), and they are best treated as synonyms.

The first important work on Lepidoptera at the beginning of this century was *Sammlung Exotischer Schmetterlinge* of Hübner, who, preserving only the specific names of the older authors and dividing the genus *Papilio* into a profusion of groups, introduced a great many terms; in the text of Vol. I. (24 pages only) Hübner adopted the binomial nomenclature, while on the plates of Vol. I. he gives three names (*Princeps heroicus Hector*, *Princeps dominans Erithonius*, etc.); the division into genera has been carried out in *Verz. bek. Schmett.* (1816), and on the plates of Vol. II. of *Samml. Ex. Schmett.*

Until 1819, when Godart described the Lepidoptera in *Enc. Méth.* IX., the

* For the sake of convenience the species which have been designated by old authors (Cramer, Linné, Fabricius, etc.) with one, three, or four names are quoted in the synonymy of this revision quadriomally.

descriptions of the Papilios had been always very incomplete ; but from this time they became more exhaustive and satisfactory. The principal works on Eastern Lepidoptera which appeared from 1819 to 1864 are Godart (1819), Horsfield (1828), Zinken (1832), several " Voyages," Lucas (1835), Boisduval (1836), De Haan (1840), Doubleday (1846), Horsfield & Moore (1857), Felder (1864). In this period falls the foundation of many Entomological Societies publishing special periodicals, of which the *Transactions of the London Entomological Society* (1812) and the *Belgian Annals* (1832) are the oldest.

In the Felderian systematic *List of Papilionidae* (1864) the species are for the first time grouped according to their natural relationship, not according to superficial resemblance ; this catalogue is not free from grave mistakes, but there are such a number of then new facts explained in the notes after the list—facts which many recent authors have entirely overlooked—that I consider the Felderian catalogue the most important work dealing with the classification of the Papilios. Felder's descriptions of new " species " in this catalogue and in his great work in *Reise Novara* (1865) are, however, not so satisfactory : in many cases the " species " are characterised from one or a few specimens, which, as the types in Felder's collection prove, were moreover in bad condition, and hence it came that Felder often mistook individual or geographical differences of his examples for specific characters : indeed nearly all the Felderian " species " of the Indo-Australian Regions are local races of older species, or mere individual aberrations, of some sixty forms about fifteen only being specifically distinct. The " types " of Felder's Papilios are not all in the Felderian collection, now in the Museum at Tring ; some are in the Vienna Museum, others in the collection of Mr. G. Semper (Altona), while of a few forms apparently no specimen has been marked as type. In no case have we been left in doubt about a Felderian form.

In the same year (1865) when Felder's *Lepidoptera* in *Reise Novara* were published, Wallace's famous article about the Eastern Papilios appeared, and the new species described in it are mostly identical with those of Felder. The exact dates of publication of Felder's and Wallace's species are unknown ; but Felder seems to have the priority of some months. Wallace's types are all lost, or if the actual type-specimen of one or the other species be preserved in the Hewitson collection, it is not marked as such and cannot be regarded as type.

Since Wallace's paper our knowledge of the Eastern Papilios has been much increased by articles and special books dealing with the Lepidoptera of limited districts. Moore's *Lepidoptera of Ceylon*, Distant's *Rhopalocera Malaya*, Semper's *Tagfalter der Philippinen*, Leech's *Butterflies of China, Corea, and Japan*, Staudinger's *Lepidoptera of Palawan*, and Elwes's *Catalogue of the Lepidoptera of Sikkim* are the most important works out of a very great number.

Local lists which, like Elwes's *Catalogue*, furnish us with notes about habits, and, like Staudinger's *Lepidoptera of Palawan*, with detailed remarks about the individual variation of the insects, are extremely useful, provided the author restricts himself to a small area and takes his notes only from specimens captured in that district. The names under which the species are enumerated in local lists are often erroneous ; but that does not do much injury, in the case of *Papilio*, to the value of the list, as one can nearly always see which form the author has meant ; we learn, indeed, from the note under *Papilio androgeus* Cram. in Elwes's *Catalogue of the Sikkim Lepidoptera* just as much as if the right name *P. memnon agenor* L. had been applied to this insect. What is, however, very confusing, and often more than

confusing, is the method adopted by Mr. Leech in his *Butterflies of China*, etc., who compiles the descriptions of the species and varieties from other authors even when the description does not fully fit the Chinese insect, and omits in many cases to say whether a certain aberration which he refers to occurs all over the area dealt with, or is localised, and whether certain species vary in the same direction and to the same extent in all the Chino-Japanese localities which have been explored.

Four recent papers deal with *Papilionidae* alone: Eimer, *Die Artbildung und Verwandtschaft bei den Schmetterlingen* (1889); Fickert, *Über die Zeichnungsverhältnisse der Gattung Ornithoptera* (in *Zool. Jahrbüch.* IV. 1889); Haase, *Untersuchungen über die Mimicry I.* (1893); Rippon, *Icones Ornithopterorum* (1889—). The general results of Eimer's and Fickert's investigations are very interesting; the papers are nevertheless of little consequence for the systematic worker, as both authors apparently employed too small a material to enable them to avoid grave errors in respect to the relationship of the various Papilios. In Haase's *Untersuchungen* so many single new facts are mentioned that we derive from this work more knowledge as regards the relation of the species and races than from any other paper since Felder's catalogue. Rippon's *Icones* are not yet completed; the types of Rippon's new forms of *Troides* are in the Tring Museum, so that we could easily decide about their specific distinctness.

After having satisfied ourselves that our identification of a Papilio was correct, we tried to trace the species, subspecies, or aberration from its first appearance in zoological literature up to the present time, and so came naturally to draw up the bibliography—which cannot be expected to be complete in every case—and synonymy of each Papilio; the bibliography of aberrations could not always be kept separate from that of the typical form of the species or subspecies. The various forms of polymorphic Papilios, like those of *P. polytes* L., *memnon* L., etc., are designated before the quotations thus: ♀⁽¹⁾, ♀⁽²⁾, ♀⁽³⁾, the numbers (1), (2), (3) corresponding with the order in which the respective forms are treated in the text; these designations could not always be employed in the synonymy, as we were sometimes unable to ascertain which special form an author had dealt with. Behind many quotations the reader will find a short note concerning the habitat, habits, etc., of the Papilio as it has been given by the quoted authors; the remarks printed *in italics* are ours.

After the heading of every species and subspecies we give a short note stating which sex and state of the Papilio are known. In the synonymy we employ, besides the usual designations for the sexes (♂, ♀),—

l. for *larva* ;
p. for *pupa* ;
metam. for *metamorphosis*.

The number of species of which we do not know the larvae and pupae is still very great; but I am sure that the entomologists residing in India, Borneo, Sumatra, etc., can in some cases easily increase our knowledge of the earlier stages of *Papilio*.

As the name of the author of a species is as necessary as the generic term to comprehend which insect is meant by any specific name, and as the generic and specific names cannot be separated from one another by a comma or point, we think it only logical not to separate the name of the actual author of a species

or variety by a comma from the specific or varietal name. When, however, an author cited by us deals with an insect under the name which has been given to it by another author, we put a comma in order to indicate that the quoting writer is not the author of the respective species; we quote for example *Papilio memnon* L., but *P. memnon*, Cram., the latter quotation being an abbreviation for *P. memnon* L., Cram.

If we have understood that a classification of animals is impossible without accepting a regulated nomenclature, we must consequently also admit that it is the stability of names which is most desirable. The first step to this stability of nomenclature is taken by accepting the law of strict priority. It is perhaps due to the enormous number of forms of insect life which wholly occupy the time of entomologists, and render alterations of names very objectionable to them, that so many papers have been written by entomologists against the strict application of the law of priority and in favour of the names "generally in use" (cf. Guenee, *Noctuelites*, 1852; *Berl. Ent. Zeit.* II, 1858; Lewis, *Proc. Ent. Soc. Lond.*, 1875; etc., etc.). The first name which a *Papilio* has received is applied to it in this revision, whether the name be correctly spelt or not, whether its meaning applies to the characters of the insect, or whether the name is confusing. A word published as the name of an animal is from the date of publication* fixed for science; nobody dare make alterations of the word in single cases; only such alterations must be allowed as apply to all names of the same category, either to all generic or to all specific names. There are four general rules according to which the specific and varietal names have been altered in this paper:—

1. All the specific and varietal names have to be treated, like the generic terms, as one word. *Papilio van de Polli* has been altered into *P. vandepolli*.

2. All the specific and varietal names have to be written with small initials in order to distinguish them from the generic terms.

3. All the specific and varietal names which are Latin adjectives or can be treated as such have to receive a masculine ending, because *Papilio* is masculine. Barbaric names, which are so much in favour among modern entomologists, cannot be altered. *Papilio chentsong* Oberth. remains *chentsong*, *P. nezahualcoyotl* Strecker remains *nezahualcoyotl*.

4. All the specific and varietal names derived from non-Latin names of persons and standing in genitive form have to be formed so that one "i" only is added to the name of the person. *Papilio hagenii* has been altered into *P. hageni*, *P. albertisi* into *P. albertisi*; *P. beccarii*, of course, remains *beccarii*.

All other alterations have been objected to in this revision.

Notwithstanding that the first name given to a *Papilio* has been generally applied, we had to replace some names by others in such cases where the same name occurred among forms of the same species (*P. butleri*, n. 139; *P. nestor*, n. 95), or closely allied species which will certainly come under one generic term in the final generic revision of the *Papilionidae* (*Troides hypolitus celebensis*, n. 9; *T. oblongomaculatus celebensis*, n. 18). I am aware that certain entomologists will not approve of these

* Though every editor nowadays ought to know that it is very important to give the exact date of issue of a work, there appear nevertheless many papers which are not dated or bear a wrong date; and it is very curious to see that the wrong date is always previous to the exact date of issue; see *Abhandl. u. Berichte Mus. Dresden*; Moore, *Lep. Indica*; *Tijdschr. v. Ent.*; *Bull. Soc. Ent. de France*; and others. Very inconvenient for quotations are those works which adopt for every number of a volume, or for every genus dealt with, a separate numbering of the pages: see *Abhandl. u. Berichte Mus. Dresden*; Grose-Smith & Kirby, *Rhop. Exot.*

alterations. In many papers, of which I mention only Hagen, *Iris* VII., Letzner, *Käfer Schlesiens*, Schilsky, *Käfer Preussens*, the opinion has been expressed and carried out that the same name can be used several times for varieties of the species of a genus: thus Hagen proposes the names *Papilio hewitsoni* var. *sumatrana*, *P. neptunus* var. *sumatrana*, *P. cloanthus* var. *sumatrana*. The theoretical reasons in favour of this system are considerable; practically, however, the system leads, not to stability, but to instability of nomenclature. What Hagen regards as varieties other people will treat as species—*P. hewitsoni* var. *sumatrana* Hagen has, indeed, previously been described by de Nicéville as a distinct species, *P. petra* Nicév.—and then the insects will have to be renamed; other scientists come afterwards again to the opinion that the insect is nevertheless a variety only and must be called with the first name. Thus a change of names will be in many cases the consequence of that system of nomenclature. As there is no general character which enables one to see at once whether a form is specifically distinct or is only a variety, and as, therefore, very often a certain form will be treated by some entomologists as species, by others as variety, and as the way to the truth is in many cases still very long, the same name dare not occur twice in the same genus, no matter whether the name be applied to species or varieties. And it is advisable even to avoid a name which already occurs in an allied genus for a new form: the genera, or the views of entomologists in respect to the delimitation of the genera, are changeable, and what now stands in two or more allied genera will often come in future under one generic term, and then the forms bearing the same name will have to be renamed (compare Kirby's *Catalogue of Heterocera* and Hampson's *Moths of India*).

The law of strict priority, without which a stable nomenclature will never be obtained, must also be applied to "composite" species, *i.e.* it must be applied to such cases where several species or varieties of a genus have received the same name by the same author. If the different forms which are erroneously treated as being the same are described one after the other—it cannot be of any consequence whether the descriptions appeared at the same time, under the same heading, or at different places—it is not difficult to decide to which insect alone the respective name must be restricted. As Linné described an Indian *Papilio* as *demoleus* in 1758, and an African one under the same name in 1764, it is evident that the name of *demoleus* must be applied to the Indian, not to the African butterfly. In 1764 Linné characterised two insects as *P. panthous*, first a black and white coloured *Papilio* as one sex, and then, as the other sex, a black and yellow coloured butterfly. We have here two *P. E. panthous* L. described one after the other, though under the same heading and number; the first characterised *Papilio* has certainly the priority, as it stands before the other. If, however, the description of the composite species does not help us in this or a similar manner, we must accept the identification of that author who is the first to deal with the insects in question after the publication of the common name. Thus we have treated all the composite species and varieties: *Troides panthous* (L.); *Troides helena* (L.); *Papilio lorquinianus philippus* Wall.; *P. demoleus* L.; etc.

When we had come to a decision about the correct name of a *Papilio*, and had learnt from the literature what is known of the insect, there remained the difficult question to solve whether this butterfly be the type of a distinct species or a varietal form of another *Papilio*. It is usually said that the specific distinctness or non-distinctness of a *Papilio* or other animal very often depends on the individual views of an author, and that there is no general parting line between species and varietal

forms. This is indeed true on first sight, and renders it necessary to explain our individual position concerning that question, the more so as the number of distinct species has been so much decreased in this paper as compared with the number in Felder's list. We carried out our researches in dividing first the six hundred odd named forms of Palaearctic and Eastern Papilios into preliminary groups which are characterised especially by differences in structure, and which will partly stand as genera in the final generic revision (*nox*-group, *hector*-group, etc.), then uniting again those forms of each group which exhibit a rather great similarity in pattern and the minor structural characters (*euryppylus*, *lycaon*, *sallastius*, *euryppylides*, *axion*, *jason*, *mikado*) into sections which mostly turned out to agree with "species," and then finally studying comparatively every form of such a section in respect to the extent of variation, with a special view to find a practical rule which might lead us to delimitate the species scientifically, not arbitrarily, in the case of each Papilio.

When we examine the individuals reared from the eggs of one *female* in every respect, we shall always find some characters by which one individual is distinguished from the other: the individual characters of a specimen are often very obvious (*P. memnon* L., *P. aristolochiae* Fabr., *P. ormenus* Guér., etc.), sometimes however perceivable only by microscopical examination. If it were possible to breed generation after generation from the offsprings of a single *female* under the natural conditions of life of that locality where the first *female* had lived as caterpillar and pupa, the differences of the specimens thus obtained would show us the extent of variation of the insect at that peculiar place. This can practically not be accomplished, and we have to content ourselves with the knowledge derived from breeding of one generation of Papilios reared from eggs which were observed to be deposited by a specimen, or from caterpillars feeding together and being apparently the offspring of one *female*. The experiences already gained by rearing of Papilios, though limited, can nevertheless very well serve as proof that the specimens dying together at a certain place, and exhibiting no greater differences among themselves than we are accustomed to find among the individuals reared from the eggs of a *female*, belong to the same kind of insect, to the same species. The breeding of specimens shows further that the variation takes place in such a manner that the extremes are connected by intergradations, except in the case of melanistic and albinistic specimens, and so-called "sports," which stand often (not always) isolated among the rest of the individuals. This gradual variation from large-spotted to small-spotted, from broad-banded to narrow-banded, from tailed to toothed specimens, enables us in most cases where there is no help by breeding to come to a right opinion about the extent of the variation of a Papilio species. If there is a gradual chain of varieties from one extreme to the other, neither the extremes nor the intermediate degrees of variation can be regarded as indicating specific distinctness of the respective individuals. When we see that the Indian *P. euryppylus* L. varies in the same locality gradually from being provided with large submarginal markings to having small spots, it is impossible that Moore's *P. acheron* is anything else but a representative of a certain degree of variation of that *euryppylus*; when we observe that in the South Indian and Ceylonese *P. sarpedon* L. the first (post-costal) spot of the median band on the forewings becomes more and more obsolete, disappears altogether on one wing, while it is still traceable on the other, it is illogical to regard the specimens without the spot as being specifically distinct (*P. thermodusa* Swinhoe); and when we further have of the South Indian and Singhalese *P. crino* Fabr. a series of specimens from one place which show a

gradual decrease, ending in total obliteration, of the hairy stripe on the forewing of the *male*, and a slight and gradual increase of the breadth of the green band, we can be quite certain that *P. montanus* Felder, without hairy stripe and with rather broader band, is only an extreme variation of *P. crino* Fabr. The number of species based on individual characters is very great.

The limits of variation of a species do not often exactly correspond at different places of a certain district. Every field-entomologist knows that, within a district where the usual or typical form flies, there are often some special localities where the specimens of that insect vary to a greater extent, and that at such a locality some or all the individuals of a species stand outside the usual limits of variation of that species. These varieties, however, are again connected with the usual form of the insect by intergradations, and thus prove to be indeed varieties. As we further know from the experiments of Dorfmeister, Weismaun, Standfuss, Merrifield, and others, that under altered circumstances the limits of variation can be much dilated, it is *a priori* probable that the specimens of a *Papilio* living on a peculiar place, like swamps or valleys, are influenced in a different degree or even in a different direction than those living on desert land or at higher elevations. Here we have localised varieties; but the material contained in collections very seldom tells us anything about the localisation of varieties within a limited district, as the specimens are mostly simply labelled "Sikkim," "Assam," "Borneo," etc. Indeed, only a local observer who collects for many years at the same place can go in for a special study of the distribution of the varieties in his district. The local lists we have of Eastern *Papilios* give already here and there observations in this direction, but the notes are so scanty that in this paper that kind of localised variation could not be distinguished from the general *individual* variation of the specimens of a given district.

Besides the effects of localised conditions of life we observe a change of the characters in the *Papilios* caused by the different climatological conditions of the seasons. While, however, it is well known that the generations of *Papilios* subsequently following one another in the course of the year in the temperate regions differ remarkably (*P. xanthus* L. and *xuthulus* Brem.; *P. bianor maacki* Mén. and *raddei* Brem.; *P. polyctor* Boisd. and *peeroza* Moore; *P. podalirius feisthameli* Dup. and *lotteri* Aust.; etc.), we have scarcely any notes about the differences of the generations of the dry and wet seasons of the tropical regions. We know in a few cases that a certain variety occurs only during some months of the year, and can sometimes conclude from the dates of capture of the specimens in collections that a *Papilio* varies within the same limits during certain months of the year; but detailed observations are almost wanting. The spring and summer generations of the Cashmerian *P. polyctor* Boisd. are different, while the Sikkimese representative form of *P. polyctor*, namely *P. polyctor ganesa* Doubl. is seasonally monomorphic; the Japanese *P. sarpedon* L. is seasonally dimorphic, while the Indian *sarpedon* is monomorphic; the Chino-Japanese *P. bianor* Cram., *P. xanthus* L., *P. machaon* L., and the Palaearctic *P. podalirius* L., are conspicuously seasonally dimorphic, while no Indo-Australian species of *Papilios* shows, to our knowledge, so marked differences between the succeeding broods. The influence of the low temperature of the winter in temperate regions seems, therefore, to be much greater than the influence of the dry season in Indo-Australia. We distinguish accordingly the *seasonal* from the *individual* variation only in the case of some Chino-Japanese, N.W. Indian, and Palaearctic species.

When we now proceed from one district into another, say from North India to Ceylon, or from Borneo to the Philippines, and examine the *Papilios*, we find a good many species which have remained the same, although the limits of variation are sometimes dilated or restricted in one or more directions of development : *P. eurypylus* L. from Java is the same as that from N. India, but is less variable : *P. aristolochiae* Fabr. from China varies more than *aristolochiae* from Sikkim, and the latter varies differently from the Javan *aristolochiae*. The differences between the Indian and Javan *eurypylus*, and those between the Indian, Chinese, and Javan *aristolochiae*, do not apply to all specimens of the respective localities, but it is only a limited number of individuals which exhibit the peculiarity in pattern, colour, or shape which is not met with amongst the individuals from other districts ; and here we have the recognisable beginning of localised variation. The green aberration *hornemanni* Pagenstech. of the blue *T. priamus urrillianus* Guér. occurs only in New Britain and New Ireland : the aberration *timorensis* Feld. of the female of *P. polytes theseus* Cran. is restricted to Timor and the neighbouring islands. When under the influence of the altered "biocoenosis," as it has been termed by Möbius, the number of aberrant specimens gradually increases, we come to such cases where the specimens of form A inhabiting a certain country are nearly all different from the individuals of the nearest allied form B, but where the areas of variation overlap, the most advanced specimens of form A being further developed than the least advanced examples of form B : some individuals of the broad-banded *P. eurypylus ekoredon* Feld. from Queensland have narrower bands than certain specimens of the narrow-banded *P. eurypylus axion* Feld. from India ; some females of the Javan *Troides helena* (L.) have the subdiscal black spots on the hindwings more isolated than certain individuals of the Indian *T. helena cerberus* (Feld.) : the individuals of the Japanese spring-brood of *P. sarpedon* L. agree with the Indo-Malayan *sarpedon* ; the specimens of the summer-broods differ somewhat and stand close to certain Chinese examples ; many Chinese specimens of *P. sarpedon* are the same as Indian ones, others are slightly different, and a great many are quite aberrant (*P. sarpedon semifuscatus* Honr.). The direction in which the development of a species takes place in the various districts is often the same, often different. In the Ceylonese and Celebesian *P. sarpedon* L. the band of the wings becomes narrow, in *sarpedon* from Queensland it is broad ; in the Chinese specimens it is liable to obliteration ; in the Celebesian and Moluccan individuals of *sarpedon* the submarginal spots to the hindwings and the median band assume a blue colour ; in the Ceylonese *sarpedon* the first spot of the median band is often absent, while in the specimens from the Bismarck Archipelago an additional spot appears, etc.

The next step in the development of localised varieties is represented by such forms as are distinguished in every individual, sometimes only in one sex, by certain characters from the nearest ally, but vary to such an extent that the lower limit of variation of one form is the upper limit of the other, so that there is a complete chain of intergradations between the least advanced specimens of one form and the most advanced of the other. The Celebesian *P. sarpedon* L. is always well recognisable, but the specimens from Sanghir and Talant agree partly with the least advanced Celebesian individuals, and approach on the other side so closely the Moluccan *P. sarpedon* that we cannot draw a parting line between the form inhabiting Celebes, Sanghir, and Talant (*P. sarpedon milon* Feld.) and the form from the Moluccas (*P. sarpedon anthedon* Feld.). *Papilio antiphus* Fabr. has quite a different appearance from *P. aristolochiae* Fabr. :

but as the first sometimes acquires the white markings on the hindwings, and the latter has them occasionally indistinctly developed, there is no character by which the two *Papilio*s are always separated. Such localised forms can, therefore, not be regarded as specifically distinct, but represent, together with other forms, the degrees of variation of an insect.

To sum up, we practically distinguish five principal degrees of variation of a species:—

1. A species with a wider range develops mostly in the different districts into more or less well-characterised local or geographical forms (raees), which are termed in this paper *subspecies*. Felder's *P. terdon* (Ceylon and S. India), *milon* (Celebes, Sanghir, and Talant, Sula Islands), *anthedon* (Moluccas), *chorredon* (Queensland), etc., are all subspecies of *P. sarpedon* L. (India, Sumatra, Java, Borneo, Philippines, Japan); and all the subspecies, together with the Linnean *sarpedon*, compose the entire species.

2. If only a relatively small number of specimens in a certain locality, not all over the area inhabited by the subspecies or species, exhibit a peculiar character, while the greater number are not different from the usual type, we have a localised *individual variation*, which we term *local individual aberration*, *aberratio alicuius loci = ab. loc.* *T. priamus urcillianus* ab. loc. *bornemannii* Pagenstech. does not occur on the Solomon Islands, being restricted to the Bismarek Archipelago.

3. The various generations of a species or subspecies are sometimes different from one another; the species is divided into seasonal forms, which are termed here *aberratio generationis aestivalis* seu *vernalis = ab. gen. aest.* seu *vern.*: *P. xanthus* ab. gen. vern. *xuthulus* Brem.; *P. polyctor* ab. gen. vern. *peeroza* Moore.

4. Among the individuals of a species or subspecies some are occasionally so aberrant that the term *individual aberration* or simply *aberration* is proposed for them: *P. machaon* ab. *niger* Heyne. When the aberration is confined to one sex, the designation (δ , φ) of that sex has been added: *P. bianor syfanus* δ -ab. *dialis* Leech: *T. priamus poscidon* φ -ab. *archidicus* (Gray).

5. There are a number of *Papilio*s (*P. achates* Sulzer, *romulus* Cram., etc.) which stand isolated, not being connected with other forms by a continuous chain of intergradations. Though rearing alone can definitely decide whether these *Papilio*s are all varieties of others, it is mostly beyond doubt that we have here to deal with forms of polymorphic species. For these forms, which all belong to the *female* sex, of certain polymorphic species (*P. polytes* L., *P. memnon* L., *P. rumanzovius* Eschsch.), the term *feminar forma* (φ -f.) is proposed: *P. memnon* φ -f. *achatiades* Esper. When the φ -f. is restricted to a certain district, we term it φ -f. loc. = φ -f. *alicuius loci*. A strict parting line between " φ -ab." and " φ -f." cannot be drawn.

With this detailed terminology the various kinds of variation, the different steps in the development of the characters of a species, can be kept separate. Since the word variety (*varietas*, Varietät) has been, and is, applied in science indiscriminately to every kind of variation, it has been avoided in this paper as a special term.

The systematist who undertakes to characterise the families and genera without an extended knowledge of the species, which are the foundation-stones of the zoological system, will often come to erroneous conclusions, and so will everybody who characterises species without studying the variations. It is impossible to understand the relationship of closely allied species without a knowledge of the

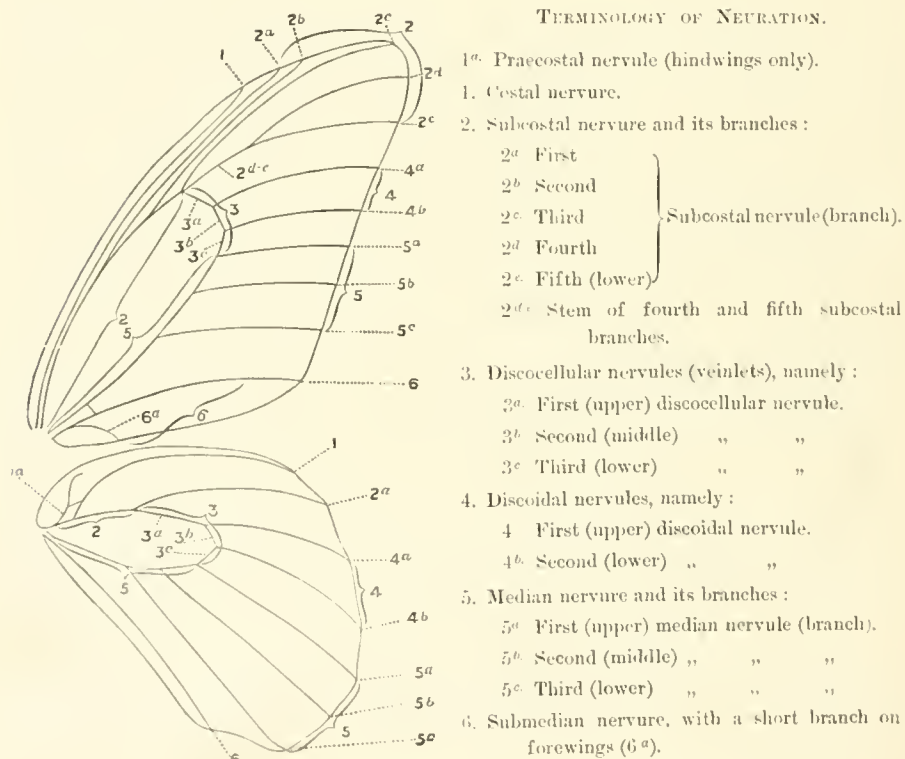
varieties, and when one neglects the latter, one neglects also the most striking facts which can serve to explain the origin of species. The highest degree of variation of a *Papilio* is the development into another species. The highly interesting *P. isander* Godm. & Salv. from the Solomon Islands stood rather isolated until now; in this paper two varieties of *P. sarpedon* L. are characterised which at once explain the peculiarities in the character of *P. isander*, and show that it differs from *sarpedon* only quantitatively. The Bismarek Archipelago is inhabited by a representative species of *P. codrus* Cram. with interrupted median band to the forewings, *P. segonax* Godm. & Salv.; from the extent of variation of *segonax* and the Solomon Islands' *codrus*, we can conclude that *segonax* was derived from *codrus*. The distinguishing characters of *P. segonax*, *isander*, and many other species (*P. acheron* Grose Smith, *epaminondas* Oberth., *ornatus* Rothsch., *pericles* Wall., *lorquiniannus* Feld., etc.) are more or less indicated in certain varieties of their nearest allies: there is nothing entirely new in their structure, pattern, or shape, and they are, indeed, in a phylogenetical sense, only further developments of *P. codrus*, *sarpedon*, *forbesi*, *antiphates*, *peranthus*, respectively. But the chain of intergradations between *P. codrus* and *segonax*, *sarpedon* and *isander*, *antiphates* and *epaminondas*, *peranthus* and *pericles*, etc., is incomplete, and there are exact parting lines between these *Papilios*. It is therefore possible to give the limits of variation of a species such as we observe them in the individuals brought home from the area inhabited by the species, and to come to a scientific decision about the distinctness or non-distinctness of a *Papilio* form. If the characters of a *Papilio* are only quantitatively different from those of another, it is *a priori* probable that both forms belong to one species; but if a long series of either *Papilio* from different places, and collected at different times, does not furnish us with a continuous bridge from one *Papilio* to the other, we have no right to fill up mentally the space between the two forms by intergradations which do not exist according to the state of our knowledge. We consider, therefore, all those *Papilios* as varietal forms of the same species which are connected with one another, in one or both sexes, by intergradations; and treat those forms as specifically distinct, however closely allied they may be, which no chain of intergraduate specimens combines.

The reasons which induce the scientist to give names to the species, genera, families, etc., apply also to the variations, and the varietal forms have accordingly been treated in this revision under names of their own. The authors of treatises about general zoology, or generic classification, can be contented with the names of the species, and the entomologists who begin to study the *Papilios*, or are not able to perceive minute differences, or collect only for the sake of collecting, will also much facilitate matters for themselves by abandoning the varietal names altogether.

In accordance with the usage of designating a species with a generic and specific term, and of writing *Papilio eurypylus* L. instead of "genus" *Papilio* "species" *eurypylus* L., we employ for the subspecies three terms, the generic, specific, and subspecific term, and write thus: *Papilio eurypylus axion* Feld. Phylogenetically interpreted *P. eurypylus axion* Feld. means that the Indian *axion* Feld. is a local form of the Amboinese *eurypylus* L., i.e. that *axion* has developed from *eurypylus*, which is most probably erroneous. The Amboinese *eurypylus* is nothing else but also a local race of a *Papilio* which ranges from India to the Papuan Islands and to which the first name (*eurypylus*) given to one of its subspecies is applied.

It is certainly wrong to say the Amboinese *Papilio eurypylus* is a species, and *lycaon* from Queensland, *pamphylus* from Celebes, etc., are only subspecies of the Amboinese *P. eurypylus* L. Rightly the Amboinese *eurypylus* ought also to be treated as subspecies, so that we could speak of *P. eurypylus* L., meaning the entire species with all its subspecies, and of *P. eurypylus eurypylus* L., *P. eurypylus lycaon* Feld., *P. eurypylus pamphylus* Feld., *P. eurypylus mikado* Leech, etc., meaning the local races. This system of nomenclature, which could not be carried out in *NOVITATES ZOOLOGICAE* as it is against the rules of nomenclature adopted by the Editors, would often much simplify the identification of the Papilios of old authors; in every case of Eastern Papilios (except *P. lacedemon* Fabr. and *P. amphitrion* Cram.) we can ascertain beyond doubt which *species* Linné, Fabricius, etc., had before them, but the special subspecies remains sometimes uncertain. In such query cases the oldest name could be kept for the whole species, while every subspecies would have to receive a name of its own.

Many remarkable facts concerning the variation and geographical distribution, a few of which the reader will find mentioned in the course of this paper, presented themselves to us; but we think it better not to give an account of them before we have dealt with the Papilios of the globe, in order to avoid unnecessary repetition, and to be able to illustrate more fully the relations between continuous and discontinuous variation on one side and the characters of subspecies and closely allied species on the other.



TERMINOLOGY OF NEURATION.

- 1^a. Praecostal nervule (hindwings only).
1. Costal nervure.
2. Subcostal nervure and its branches :

2 ^a First	}	Subcostal nervule (branch).
2 ^b Second		
2 ^c Third		
2 ^d Fourth		
2 ^e Fifth (lower)		
2 ^{d-e} Stem of fourth and fifth subcostal branches.		
3. Discocellular nervules (veinlets), namely :

3 ^a First (upper) discocellular nervule.
3 ^b Second (middle) " "
3 ^c Third (lower) " "
4. Discoidal nervules, namely :

4 First (upper) discoidal nervule.
4 ^b Second (lower) " "
5. Median nervure and its branches :

5 ^a First (upper) median nervule (branch).
5 ^b Second (middle) " " "
5 ^c Third (lower) " " "
6. Submedian nervure, with a short branch on forewings (6^a).

GENUS **TROIDES** Hülfner, *Verz. bek. Schmettl.* p. 88 (1846).

Syn.: *Ornithoptera* Boisid., *Spec. Gén. Lép.* I. p. 173 (1836).

1. **Troides priamus** (L.) [♂, ♀, metam.].

Vincentius, *Mus.* p. 40 (1719) (Amboina); *Musci imp. Patr.* Vol. I p. 664 n. 9 (1742) (Amboina); Aubenton, *Planch. Entom.* t. 45 (♂) (1745); Seba, *Thes.* IV. p. 54. t. 44. f. 22-23 (♀) (1765) (Amboina).

♂. *Papilio Equus Trojanius priamus* Linné, *Syst. Nat.* ed. x. p. 458. n. 9 (1758) (Amboina); id., *Amoen. Acad.* V. t. 3. f. 203 (1758); Clerck, *Icom. Ins.* II. t. 17. f. 1 (1764); Linné, *Mus. Lud. Ulr.* p. 182. n. 1 (1764); Houtt., *Nat. Hist.* I. 11. p. 186. n. 1 (1767); Linné, *Syst. Nat.* ed. xii. p. 744. n. 1 (1767); Beckm., *Anfangsgr.* p. 105. n. 1 (1767); Müll., *Naturs. V.* I. p. 565. n. 1 (1774); Fabr., *Syst. Ent.* p. 446. n. 16 (1775); Cram., *Pap. Erot.* I. p. 35. t. 23. f. A. B (1775) (Amboina); Goeze, *Ent. Beytr.* III. I. p. 28. n. 1 (1779); Fabr., *Spec. Ins.* II. p. 6. n. 21 (1781); Blumenb., *Handb.* p. 356. n. 1 (1782); Jablonsky, *Naturs. Schmettl.* I. p. 195. n. 1. t. 1. f. 1. 2 (1783) (Amboina); Esper, *Aust. Schmettl.* p. 11. n. 1. t. 1. f. 1. (1784); Fabr., *Mant. Ins.* II. p. 3. n. 22 (*laps. typ.* "28") (1787); Gmelin, *Syst. Nat.* I. 5. p. 2230. n. 1 (1790); Fabr., *Ent. Syst.* III. I. p. 11. n. 32 (1793).

♀. *Papilio Equus Trojanius panthous* Linné, *Syst. Nat.* ed. x. p. 461. n. 16 (1758) (India); Clerck, *Icom. Ins.* II. t. 19 (1764); Linné, *Mus. Lud. Ulr.* p. 195. n. 14 (1764) (*p.p.*); Houtt., *Nat. Hist.* I. 11. p. 199. n. 16 (1767); Linné, *Syst. Nat.* ed. xii. p. 748. n. 17 (1767) (*p.p.*); Müll., *Naturs. V.* I. p. 571. n. 17 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 448. n. 25 (1775) (*p.p.*); Cram., *Pap. Erot.* II. p. 39. t. 123. f. A; t. 124. f. A (1777); Goeze, *Ent. Beytr.* III. I. p. 37. n. 17 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 9. n. 36 (1781); Jablonsky, *Naturs. Schmettl.* I. p. 207. n. 8. t. 5. f. 1. 2 (1783); Esper, *Aust. Schmettl.* p. 45. n. 17. t. 10 (1786); Gmelin, *Syst. Nat.* I. 5. p. 2233. n. 17 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. I. p. 18. n. 56 (1793) (*p.p.*).

♂. *Papilio priamus*. Donovan, *Ins. of India* t. 16 (1800); Shaw, *Gen. Zool.* VI p. 207. t. 65 (1806); Godart, *Enc. Méth.* IX. p. 25. n. 1. t. 2. f. 4 (1819).

♂ ♀. *Troides priamus*, Hübner, *Verz. bek. Schmettl.* p. 88. n. 919 (1816); id., *Samml. Ex. Schmettl.* II t. 116. 117 (♀) (1816).

♀. *Papilio panthous*, Godart, *Enc. Méth.* IX. p. 25. n. 2 (1819).

♂ ♀. *Papilio priamus*, Thon, *Ent. Arch.* p. 124 (1828); id., *Naturg. Schm.* p. 16. t. 1. f. 1; t. 2. f. 3; t. 3. f. 2. 3 (♂, ♀) (1837); Gray, *Cat. Lep. Ins. B. M.* I. p. 1. n. 1 (1852) (Amboina); id., *List Lep. Ins. B. M.* I. p. 2. n. 1 (1856) (Amboina); Cerani; Feld, *Verh. z. b. Ges. Wien* p. 290. n. 8. & p. 332. n. 8 (1864) (Amboina; Ceram).

♂ ♀. *Ornithoptera priamus*, Boisduval, *Voy. Astrolabe. Lép.* p. 33. n. 1 (*nec fig.*) (1832) ("Ornithoptera" *gen. nov., sed nom. nud.!*); id., *Spec. Gén. Lép.* I. p. 173. n. 1 (1836) (*p.p.*); Duncan, *Favriq. Butt.* p. 89. t. 1. f. 1 (1837); Blanch., *Hist. Nat. Ins.* III. p. 420. n. 1 (1841); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 1 (1846) (*p.p.*); Vollenh., *Tijdschr. v. Ent.* III. p. 70. n. 1 (1860) (Amboina); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 35. n. 1 (1865) (Amboina; Ceram); Koch, *Indo-Austr. Lep.-Fauna* p. 35 (1865) ("Ceylon" *loc. err.*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 234. n. 1 (1869); Kirsch., *Mitth. Mus. Dresden* I. p. 110 sub n. 1 (1877); Oberth., *Et. d'Ent.* IV. p. 27. n. 1 (1879) (*p.p.*); Auriv., *Konigl. Sr. Vet. Ak. Handl.* XIX. 5. p. 8. n. 1 (♂) and p. 19. n. 14 (♀) (1882) (Recensio Lep. Mus. Utr.); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 201 (1884); Honr., *Berl. Ent. Zeit., Sitz.-Ber.* p. 11 (1886); Fickert, *Zool. Jahrbüch.* p. 702 (1889); Ribbe, *Iris* II p. 207. n. 1 (1890) (Cerani); Rippon, *Icom. Ornith.* p. 8. t. 1. Ia. 1b (1890).

Troides priamus and the various so-called "species," as *arruanus*, *poseidon*, *pegusus*, etc., are so variable in every locality in the shape of the wings, the amount of green on either side of the forewings, the number and size of the black and yellow submarginal spots of the hindwings in the *males*, in the number, size, and shape of the whitish markings in the *females*, and especially also in the neuration of both sexes, that none of the characters by which the respective authors have distinguished their "species" is found in every specimen from one district; moreover,

* Linné used to give only three names, omitting the name of the subsections, *Trojanius* and *Achiens* respectively.

if one can compare a larger series of individuals from the same locality, one will always find some which exhibit the distinguishing characters of several "species," and, therefore, belong strictly to neither of them. In the state of imago the various green *Troides* and the blue *urwillianus* show no constant characters which allow us to draw exact parting lines between the "species." As the caterpillars and pupae, as far as we know them, also do not differ in any important points, it is beyond doubt that the blue and all the green *Troides* are forms of one species, the oldest name of which is *T. priamus* L. The yellow *Troides* (*croesus* and *lydius*), however, which some recent authors treat as being also varieties of *T. priamus*, will have to be kept separate specifically for reasons given below.

Dr. Fickert, in his important paper in *Zool. Jahrbücher*, 1889 ("Zeichnungsverhältnisse der Gattung *Ornithoptera*"), distinguishes the following local forms of *T. priamus* L.:—

(1) "*Ornithoptera*" *priamus* L.; (2) var. *cassandra* Scott; (3) var. *richmondia* Gray; (4) var. *euphorion* Gray; (5) var. *arunna* Feld.; (6) var. *prononius* Gray; (7) var. *cronius* Feld.; (8) var. *pegasus* Feld.; (9) var. *poseidon* Doubl.; (10) var. *archideus* Gray; (11) var. *croesus* Wall.; (12) var. *lydius* Feld.; (13) var. *urwilliana* Guér.

Dr. Fickert's material has certainly not been large, though he tells us the contrary (see p. 762, *l.c.*), else he would not have treated the "varieties" 4 to 10 as being separate local races. I must here be allowed to dilate somewhat longer upon the characters of "*O. priamus* var. *arunna*," for example, which Dr. Fickert calls a constant local form (*l.c.*, p. 719), restricted to the Aru Islands. He distinguishes *arunna* especially

- (1) by the amount of green on the median vein of the forewings;
- (2) by the costal green band of the forewings being of equal breadth;
- (3) by the presence of four black spots on the hindwings;
- (4) by the green patch of the cell of the forewings beneath occupying the posterior half of the cell.

Now, besides Felder's type-specimen, I have eleven *males* from the Aru Islands before me—not one of which is exactly identical with the type—and these individuals exhibit in respect to the characters enumerated above the following variation:—

(1) In two specimens there are only a very few green scales upon the median nervure; in a third individual (measuring only 63 mm. from the base to the tip of the forewing) the extreme bases of the two lower median nervules and the partition of the median nervure between these branches are green; in three others the green scaling is a little more extended along the median veins; in four individuals the whole median nervure and the bases of the three median and lower discoidal nervules are green; and in two examples the upper median nervule is entirely green from its origin to the green submarginal band.

(2) The costal green band varies in shape, as in specimens from other localities; none of the twelve *males* has the band of more equal breadth than many of my fifty New Guinea specimens have.

(3) The number of black spots on the hindwings varies from 2 to 4; in my New Guinea examples it varies from 0 to 5.

(4) The green patch in the cell of the forewings beneath occupies in one individual not half the cell, in another three-quarters of the cell; in some individuals there is, besides that patch, a longitudinal narrow band behind the subcostal vein, in other examples the anterior portion of the cell is quite black.

That the *females* from the Aru Islands are not constant is clearly enough proved by their having received the names of *arruana* Feld., *kirschi* Oberth., *eumaeus* Rippon (and *goliath* Oberth.?).

After having compared extensive series of specimens from different localities, I come to the conclusion that *T. priamus* (Gray), *archideus* (Gray), *cronius* (Feld.), *triton* (Feld.), *pegasus* (Feld.), *kirschi* (Oberth.), *goliath* (Oberth.), *hecuba* (Röb.), *eumaeus* (Rippon), *valentinus* (Vuillot), and *bornemutani* (Pagenst.) are all individual aberrations, and must either be treated as such or as synonyms, and that there are but six geographical forms of *Troides priamus* (L.), which can be grouped as follows:—

I. ♂ with the median vein of the forewings black.

(a): *T. priamus* (L.) from the Southern Moluccas (Amboina and Ceram);

(b): *T. priamus euphorion* (Gray) from North Australia;

(c): *T. priamus richmondii* (Gray) from the southern parts of Eastern Australia.

II. ♂ with the median nervure of the forewings above green; forewings more pointed at the apex, their hind angles less rounded than in the preceding forms; hindwings in ♂ and ♀ less evenly rounded, with the anterior angle more distinct.

(d): *T. priamus poseidon* (Doubl.) from New Guinea, Wajgeu, Aru, D'Entrecasteaux Islands and the other islands near the coast of New Guinea, Cape York;

(e): *T. priamus boisduvali* (Monfr.) from Woodlark Island;

(f): *T. priamus urvillianus* (Guér.) from New Britain; New Ireland, and the Solomon Islands.

Whether *boisduvali* will be maintained as a local form when fresh material comes from Woodlark Island seems to me to be rather doubtful. The two groups of subspecies, it must be understood, are not constant in those characters by which I have separated them; it is, however, very remarkable that, whilst *nearly all* the *male* specimens from New Guinea and the adjacent islands have the median vein more or less conspicuously covered with green scales, these green (or blue) scales are very sparse or absent in most individuals from the Bismarck Archipelago [*T. priamus urvillianus* (Guér.)], and *always* absent from the subspecies inhabiting Australia and the Southern Moluccas. We shall find many cases in the course of this paper illustrating the same interesting fact, that the subspecies from New Britain, New Ireland, or the Solomon Islands, from Australia, the Southern Moluccas, and often those found in the Aru and Key Islands, have certain positive or negative characters in common by which they are distinguished from the New Guinea race (compare *P. agamemnon neopommeranus* Honr. and *P. agamemnon argyurus* Druce; *P. ulysses orsippus* Godm. & Salv. ♀ and *P. ulysses* L. ♀; *P. phestus* Guér. and *P. ambrac egypius* Misk.; *P. polydorus* L. and *P. polydorus norobritannicus* m., etc.).

(a): **T. priamus** (L.), forma typ. [♂, ♀, metam.].

♂. The number of black subdiscal spots on the *upperside* of the hindwings varies from 2 to 6 in my series; the costal yellow mark is always present; many individuals have from 1 to 3 submarginal yellow spots between the subcostal and second discoidal nervules.

Below, the discal and submarginal green markings of the forewings are sometimes merged together, and include a series of small black spots; in other examples those markings are rather widely separated. On the hindwings the costal nervure, the

discocellular veinlets, and the median nerve from the apex of the cell as far as the lower median branch, are always narrowly bordered with black; the black patch at the anal angle extends often down to the base of the wing; sometimes it includes a hook-like yellowish green spot, placed at the hinder side of the lower median nervule.

The length of the forewing varies in my specimens from 70 to 95 mm.

♀. The cell of the forewings is nearly always devoid of a white mark; the number and size of the discal white markings are exceedingly variable. The four tear-shaped markings of the hindwings almost reach the cell, but stand much farther from the outer margin than in the other subspecies of *T. priamus*; the discal part of the first of these markings, standing between the discoidal nervules, is sometimes obliterated, as are very often the adnervular whitish lines connecting the discal parts with the submarginal parts of the markings.

Below, the two anterior submarginal spots of the hindwings are more or less tinged with yellow, and so are sometimes the submarginal portions of the tear-shaped markings; many specimens have a small postcostal spot situated inside the large submarginal one, and connected with the latter along the costal nervure; the second submarginal spot is sometimes prolonged along the subcostal vein towards the base; this prolongation does not extend to the cell. The cellule between the lower median and the submedian veins is mostly unicolorous, except that it is browner at the base than towards the outer margin, but in a few individuals there is a small yellow or whitish yellow spot near the anal angle.

Hab. Southern Moluccas: Amboina (11 ♂, 11 ♀); Ceram (3 ♂).

(b): *T. priamus euphorion* (Gray) (♂, ♀, larva, pupa).

♀. *Papilio euphorion* Gray, *Cat. Lep. Ins. B. M.* 1. p. 4 n. 6. t. 2. f. 3 (♀) (1852) (N. Australia): *id.*, *List Lep. Ins. B. M.* 1. p. 3. n. 6 (1856) (N.W. Coast of Australia): Feld., *Verh. z. b. Ges. Wien* p. 290 n. 10 (1864).

♂ ♀. *Ornithoptera cassandra* Scott, *Tr. Ent. Soc. N. S. Wales* 1. p. 131 t. 10 (♀) (1866) (Pt. Denison): *id.*, *loc.* 11. p. 49 (♂, ♀) (1869) (Rockingham Bay). Rippon, *Icon. Ornith.* p. 8. t. 2a, 2b (1890), & plate (♀) & text (1891)?

♂ ♀. *Papilio (Ornithoptera) cassandra*, Butler, *Brenchley's Cruise of the Curacoa* p. 174 t. 50 (♂) (1873) (Queensland).

♂ ♀. *Ornithoptera priamus* var. *promachus*, Semper, *Journ. Mus. Godeffroy* Heft 14. p. 41. sub n. 128 (1878) (Rockhampton, *hæc subsp.? loc. err.!*).

♂ ♀. *Ornithoptera priamus* var. *cassandra*, Semper, *loc.* p. 41. sub n. 128 (1878) (Queensland).

The name of *cassandra* is based on one of the numerous individual aberrations.

♂. On an average rather smaller than *T. priamus* (L.); underside of hindwings with the subcostal, discocellular, and median veins broadly bordered with black; green area outside the submarginal black spots of a golden green colour.

The green parts of the wings have often a yellowish tint; sometimes they are feebly bluish. The breadth and length of the green streak running along the inner and the outer margin of the forewings are exceedingly variable. The hindwings have above four or five black spots, the anterior of which is sometimes so much enlarged that it occupies the whole of the cellule between the costal and subcostal nervures; the yellow submarginal spots vary in number from 0 to 5.

Below, the discal and submarginal bluish green spots of the forewings are always separated, except those before the upper discoidal nervule; the spot within the cell is very small in some individuals.

♀. Abdomen blackish above. Wedge-shaped whitish markings on the upperside of

the hindwings farther from the cell and nearer to outer margin than in *T. priamus* (L.) Most specimens with a green middle streak on the thorax.

The white patch within the cell of the forewings varies exceedingly; in some specimens from Cairns, Queensland, it has a length of 16 and a breadth of 8 mm. (as in Gray's figure), while in other examples from the same place it is reduced to two or three minute spots. The discal spots are just as variable; sometimes all, or nearly all, the markings between the second discoidal nervule and the submedian vein have disappeared.

On the hindwings above, the postcostal spot is mostly yellow; the other submarginal markings, and the submarginal portions of the wedge-shaped spots, are also yellowish, but much suffused with black scales. In some individuals the interior parts of the wedge-shaped markings are more or less obliterated.

The submarginal spots of the hindwings below are of a much purer yellow colour than above; the two anterior ones are small; at the anal angle, between the submedian nervure and the lower median nervule, there is always a yellow mark of variable size.

I have some dry caterpillars of this subspecies, from Cedar Bay, N. Queensland, which agree with the description of the larva of *richmondiius* given by Schneider (see below), but the dorsal spines on the seventh segment seem to be more yellow than in that race, being in fact all yellow except at the tip. Neither in *euphorion* nor in *richmondiius* is there a lateral band. Chrysalis as in *richmondiius*.

Hab. Northern Australia: Queensland (41 ♂, 25 ♀).

(c): **T. priamus richmondiius** (Gray) [♂, ♀, metam.].

♂ ♀. *Papilio richmondia* Gray, *Cat. Lep. Ins. B. M.* 1 p. 2. n. 2. t. 2. f. 1 (♂). 2 (♀) (1852) (N. S. Wales); id., *List Lep. Ins. B. M.* 1. p. 2. n. 2 (1856) (N. S. Wales); Feld., *Verh. z. b. Ges. Wien* p. 290. n. 9. & p. 332. n. 8 (1864).

♂ ♀. *Ornithoptera richmondia*, Horsfield & Moore, *Cat. Lep. Ins. Mus. E. I. C.* 1. p. 86. n. 175 (1857) (N. S. Wales); Koch, *Labo-Austral. Lep. Fauna* p. 36. n. 2. (1855); Rippon, *Icon. Ornith. text & plate* (1889) & t. n. f. 1. 1a (♂). 2 (♀) (1899).

♂ ♀. *Ornithoptera priamus* var. *richmondia*, Semper, *Journ. Mus. Godeffroy* Heft 14. p. 41. sub n. 128 (1878) (Rockhampton: Richmond R.); Oberth., *Et. d'Ent.* IV. p. 29 sub n 1 (1879) (N. S. Wales); Strudling & Schatz, *Errot. Schwett.* 1. p. 3 t. 1 (♂, ♀) (1881).

Ornithoptera richmondii (C), Schneider, *Entomol.* XXVIII p. 93 (1895) (*W. t. an. euphorionis*).

Smaller than *T. priamus euphorion* (Gray) in both sexes.

♂. The green band along the inner margin of the forewing more or less obliterated.

♀. Hindwings above with four wedge-shaped white markings, which approach the cell; the submarginal spot between the subcostal and upper discoidal nervules is connected along the subcostal nervule with a discal spot, and thus forms a kind of halfring-shaped mark. Abdomen as in *euphorion* (Gray).

This subspecies is in pattern just as variable as its more northern relative *T. priamus euphorion* (Gray). The thoracic greenish band of the *female* is absent or indistinct. The cellular patch of the forewings of the same sex is in some individuals ten times as large as in others; occasionally there is a small spot within the apex of the cell of the hindwings.

Caterpillar without bands on the sixth and seventh segments.

Hab. New South Wales (10 ♂, 8 ♀).

(d) *T. priamus poseidon* (Doubl.) = ♂, ♀, metam.].

- ♂. *Papilio priamus* var., Quoy et Gaim., *Voy. de l'Uran.* p. 551. t. 83. f. 3 (1815) (Rawak); Thon., *Ent. Archiv.* p. 125 (1828).
- ♂ ♀. *Ornithoptera priamus*, Lucas (nec Linné, 1858), *Lép. Exot.* t. 1 (♂) (1835).
- ♂. *Ornithoptera poseidon* Doubleday, *Ann. Mag. N. H.* XIX. p. 173 (1847) (Darnley I.); Westw., *Cal. Or. Ent.* p. 23. t. 11 (♂) (1848).
- ♂ ♀. *Papilio pronomus* Gray, *Cat. Lep. Ins. B. M.* I. p. 2. n. 3. t. 1. f. 1 (♂). 2 (♀) (1852) (Cape York); id., *List Lep. Ins. B. M.* I. p. 2. n. 3 (1856); Feld., *Verh. z. b. Ges. Wien* p. 290. n. 11 (1864).
- ♂. *Papilio poseidon*, Gray, *Cat. Lep. Ins. B. M.* I. p. 3. n. 5 (1852); id., *List Lep. Ins. B. M.* I. p. 3. n. 5 (1856); Feld., *Verh. z. b. Ges. Wien* p. 290. n. 17. & p. 333. n. 13 (1864).
- ♂. *Ornithoptera archidæus*, Felder, *Wien. Ent. Mon.* III. p. 264 n. 12 (1859) (New Guinea).
- ♂ ♀. *Ornithoptera poseidon*, Vollenhoven, *Tijdschr. v. Ent.* III. p. 70. n. 2. & p. 89 (1860) (New Guinea); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 35. n. 2 (1865); Godm. & Salv., *P. Z. S.* p. 647 (1878) (D'Entrecasteaux Is. and Possession Bay); Ribbe, *Iris* III. p. 41 (1890) (Key Is.); Tryon, *Report Adminstr. Brit. N. Guin.* II. App. V. p. 112 (1892); Rippon, *Icon. Ornith.* text (1895).
- ♂. *Papilio triton* Felder, *Verh. z. b. Ges. Wien* p. 290. n. 16. & p. 332. n. 12 (1864) (Rawak).
- ♂ ♀. *Papilio pegasus* Felder, *Verh. z. b. Ges. Wien* p. 290. n. 18 (1864) (New Guinea; nom. nud.); Felder, *Reise Novara, Lep.* I. p. 6. n. 4. t. 2. f. a (♂). b (♀) (1864) (Dorey).
- ♂ ♀. *Ornithoptera pegasus*, Kirsch, *Mitth. Mus. Dresden* I. p. 110. n. 1. t. 5 (1877) (New Guinea); Grose Smith, *Nor. Zool.* p. 331. n. 1. (1894) (Humboldt Bay).
- Ornithoptera pronomus*, Koch, *Indo-Austral. Lep. Fauna* p. 37 (1865); Mathew, *Tr. Ent. Soc. Lond.* p. 168 (1888) (life hist.).
- ♂ ♀. *Ornithoptera priamus* var. *pronomus*, Semper, *Journ. Mus. Godeffroy*, Heft 14. p. 41 sub. n. 128 (1878) (Cape York; "Rockhampton" loc. err. ?); Fickert, *Zool. Jahrb.* p. 706. n. 6 (1889).
- ♂ ♀. *Ornithoptera priamus* var. *aruanus* (!), Oberthür, *Et. d'Ent.* IV. p. 27. sub. n. 1 (1879) (New Guinea & Aru Is.).
- ♂ ♀. *Ornithoptera priamus* var. *arwana*, Oberthür, *Ann. Mus. Civ. Genova* XV. p. 46. f. n. 1 (1880); Fickert, *Zool. Jahrb.* p. 704 n. 5. t. 20. f. 3 (♂), 4 (♀) (1889); Ribbe, *Iris* III. p. 39 (1890) (Aru Is.; larv. & pup.).
- ♂ ♀. *Ornithoptera priamus*, Ribbe, *Iris* I. p. 77. n. 1 (1886) (Aru Is.).
- ♂. *Ornithoptera priamus* var. *pegusus*, Fickert, *Zool. Jahrb.* p. 707. n. 8 (1889).
- ♂. *Ornithoptera priamus* var. *hecuba* Röber, *Tijdschr. v. Ent.* XXXIV. p. 263 (♂, nec ♀) (1891) (Key Is.).
- ♀. *Ornithoptera cumacus*, Rippon, *Ann. Mag. N. H.* (6). X. p. 193 (♀, nec ♂) (1892) (Aru Is.); id., *Icon. Ornith.* text & plate (♀, nec ♂) (1892).
- ♂ ♀. *Ornithoptera arnani* var. *valentina* Vuillot, *Bull. Soc. Ent. France* p. 124 (1892) (Pt. Moresby; dwarfed specimens).
- ♂. *Ornithoptera pegasus* var., Pagenstecher, *Jahrb. Vass. Ver. Nat.* p. 63. n. 1. t. 3. f. 1 (♂) (1894) (New Guinea).

Fourteen names have been bestowed on this subspecies of *T. priamus*. The respective authors were mostly under the erroneous impression that certain characters were restricted to the individuals from certain districts, and so it came that the specimens from Cape York, from Darnley Island, New Guinea, Aru Islands, Waigeu, etc., have been regarded as belonging to a number of distinct species. But in a long series of individuals from one locality, say from Waigeu or German New Guinea, all these so-called species or local forms will be found together; whilst, on the other hand, only a small proportion of the specimens from the Aru Islands are typical *aruanus*, from Waigeu *archidæus*, from Cape York *pronomus*, etc. The distinguishing characters of those "species," "varieties," and "aberrations" are entirely individual, and the fourteen forms must be treated as individual aberrations of one local race, of which the oldest name is *poseidon* (Doubl.). As these aberrations of *poseidon* are, however, mostly based on very unimportant characters, which, moreover, are partly re-found in several of the named variations; further, as scarcely two

specimens are exactly alike; and thirdly, as some of the most conspicuous aberrations have not received a name, I think it is not only extremely difficult to say which specimens really belong to ab. *arvuanus* (Feld.), or to ab. *pronomus* (Gray), etc., but I believe it is also quite unnecessary to keep individuals that are aberrant in a very unimportant way separate under names of their own. Important aberrations, however, I regard as being worthy of names: important aberrations I call such as point to other subspecies or species, or show the extreme development of one or more characters; such aberrations give us the best hints to understand the relations of the subspecies or of closely allied species. So I shall enumerate ♂-ab. *eumæus* (Rippon), because it points to *T. priamus urvillianus* (Guér.) by its bluish colour; ab. *goliath* (Oberth.), as it reminds one of *T. victoriæ* (Gray), *paradiseus* (Stauding.), and the yellow *Troïdes* in having the basal portion of the fifth subcostal nervule of the forewings much elongated. As I said before, some of the most conspicuous aberrations have no names: these are the *females* without spot in the cell of the forewings [as in *T. priamus* (L.)] and the *females* with the cellular patch of the forewings so much enlarged as to occupy nearly the whole cell [as in *T. lydius* (Feld.)].

♂. Median nervure of the forewings above more or less green. Black outer margin of the hindwings much narrower than in *T. priamus* (L.); below, the discocellular nervules of the hindwings very narrowly bordered with black. Many *males* assume a purple colour in certain lights.

The principal aberrations are as follows:—

(a²): No name. Median nervure of forewings without green scales.

(b²): ♂-ab. *cronius* (Feld.).

Ornithoptera priamus var., De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 18 (1840) (S.W. New Guinea).

Papilio cronius Felder, *Verh. z. b. Ges. Wien* p. 290, n. 12, & p. 332, n. 9 (1864).

Ornithoptera priamus var. *cronius*, Fickert, *Zool. Jahrb.* p. 706, n. 7 (1889).

Hindwings above without any (black or yellow) spots.

In Felder's *pegasus* there are two very feeble black spots on the hindwings.

(c²): ♂-ab. *eumæus* (Rippon).

Ornithoptera eumæus Rippon, *Ann. Mag. N. H.* (6). X. p. 193 (♂, nec ♀) (1892) (Aru Is.); id., *Icon. Ornith.* text & plate (♂, nec ♀) (1892).

Bluish green, instead of green or yellowish green.

♀. Cell of forewings very seldom without a white patch; the two discal markings of forewings, situated between the median nervules, mostly large. The white markings of the hindwings stand closer to the outer margin than in *T. priamus* (L.); they are large, with the black spots comparatively small; between the lower median nervule and the anal angle there is nearly always a large white mark.

(d²): ♀-ab. *brunneus* ab. nov.

White markings on upperside of forewings entirely obliterated, except a point-like spot between the lower median nervules.

This remarkable aberration has been found by Mr. A. S. Meek on Fergusson Island, D'Entrecasteaux Islands; among some hundred specimens from that locality there are all intergradations between this aberration and ♀-ab. *archidæus* (Gray).

(*r*¹): No name.

Ornithoptera pegasus var. Kirsch, *Mitth. Mus. Dresden* I. p. 111, sub n. 1, t. 5, f. 2 (1877) (Dutch New Guinea).

White patch within cell of forewings obliterated: discal markings present: tear-shaped markings to hindwings very short.

(*f*²): No name.

White patch of cell of forewings occupying nearly the whole of the cell.

(*g*²): ♀-ab. *archidæus* (Gray).

Ornithoptera priamus var., Boisduval, *Voy. Astrée-Fébr. Léop.* p. 35, sub n. 1, t. 4, f. 1, 2 (1832) ("Celebes" loc. err.); id., *Spec. Gén. Léop.* I. p. 174, sub n. 1 (1836) ("Celebes" loc. err.).

Papilio archidæus Gray, *Cat. Lep. Ins. B. M.* I. p. 3, n. 4 (1852) ("Celebes" loc. err.); id., *List Lep. Ins. B. M.* I. p. 2, n. 1 (1856) ("Celebes" loc. err.).

Papilio archidæus, Felder, *Fisch. z. b. G. s. Wien* p. 290, n. 19 & p. 333, n. 11 (1864) ("Celebes" loc. err.).

Ornithoptera posidon var. *archidæus*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 36, sub n. 2 (1865) (Waigeu); Fickert, *Zool. Jahrb.* p. 709, n. 10 (1889).

Cell of the hindwings with a white spot at the apex.

This aberration is apparently the usual form of the ♀ on Waigeu, but it is neither confined to that island nor do all Waigeu specimens belong to *archidæus*.

(*h*²): ♀-ab. *kirschi* (Oberthür).

Ornithoptera pegasus var., Kirsch, *Mitth. Mus. Dresden* I. p. 111, sub n. 1, t. 5, f. 1 (1877) (New Guinea).

Ornithoptera acruana ab. *kirschi* Oberthür, *Et. d'Ent.* XII. p. 1, sub n. 2 (1888).

Cellular patch of the forewings and markings of the hindwings more or less yellow on the upperside.

(*i*²): ♀-ab. *goliath* (Oberthür).

Ornithoptera acruana ab. *goliath* Oberthür, *Et. d'Ent.* XII. p. 1, sub n. 2 (1888) (Hab.?).

Ornithoptera goliath Oberthür, *Et. d'Ent.* XIX. p. 1, t. 4, f. 19 (1894) (Waigeu? Dorey?).

Mr. Oberthür considers this insect to be either a large form of *T. paradiseus* (Stauding.) or a distinct species. It is distinguished, according to Oberthür, by its superior size, the forewing having a length of 125 mm., by the eyes being bordered with white, and by the pattern of the wings resembling that of *paradisæus*.

The figure in *Et. d'Ent.* XIX. is unfortunately a bad one: I had, however, a photograph of the type kindly lent to me by Mr. Rippon, which shows that Mr. Oberthür's first identification, in my opinion, was correct. It is well known, and scientifically explained by Dr. Pagenstecher, that the venuration of *T. paradisæus* (Stauding.) differs from that of *T. priamus* (L.) especially in the position of the third subcostal nervule of the forewings and in the superior length of that part of the subcostal vein that lies between the end of the cell and the origin of the fourth branch. In the photograph of *goliath* the third subcostal vein originates a good way before the end of the cell, as in *T. priamus* (L.), while the fourth subcostal nervule branches off almost as far from the end of the cell as in *T. paradisæus* (Stauding.). As the third subcostal vein stands just at the end of the cell in all examples of *T. paradisæus*, and before the end of the cell in *T. priamus* and *goliath*, as farther the position of the fourth subcostal vein is extremely variable in *priamus*, it seems to me to be clear enough that, judging from the venuration alone, we must regard *goliath* as being an extreme form of *T. priamus*—that is to say, an extreme aberration of *T. priamus poseidon* (Doubt.).

As regards the characters of pattern, I must say that they do not give us any important hints: the type-specimen is in bad condition, and the pattern in Oberthür's figure is not correct; I cannot see that anything in the pattern of *goliath* points against its being a specimen of *T. priamus poseidon* (Doubl.). That the eyes are posteriorly bordered with white is not to be wondered at, as we find this character in all *females* of *priamus* and its subspecies, though the white may be a little more conspicuous in *goliath*.

(*h*²): ♀-ab. *hecuba* (Röber).

Ornithoptera priamus var. *hecuba* Röber, *Tijdschr. v. Ent.* XXIV. p. 263 (♀, nec ♂) (1891) (Key Is.).

Hindwings, underside, with two whitish or yellowish spots between the costal margin and the upper discoidal nervule inside the two first submarginal markings.

This form, which occurs all over the area occupied by *T. priamus poseidon* (Doubl.), reminds one of the pattern of *T. priamus richmondii* (Gray).

Hab. New Guinea (52 ♂, 46 ♀); Waigeu (8 ♂, 12 ♀); Salwatty; Mysol; Key Islands; Aru Islands (12 ♂, 9 ♀); Islands of Torres Strait and Cape York (7 ♂, 6 ♀); Louisiade Archipelago; and D'Entrecasteaux Islands (some hundred specimens, not yet sorted out).

(*e*): **T. priamus boisduvali** (Montr.) [♂, ♀].

♂ ♀. *Ornithoptera boisduvali* Montrouzier, *Ann. Soc. Phys. Nat. Lyon* p. 393 (1856) (Woodlark I.); id., *Essai Faune Woodlark* p. 116 (1857) (Woodlark I.); Butler, *P. Z. S.* p. 288. n. 85 (1874).

Papilio oceanus Felder, *Verh. z. b. Ges. Wien* p. 290. n. 13. & p. 332. n. 10 (1864) (Woodlark I.; nom. nov. loco *boisduvali* Montr.).

Probably the same as *T. priamus poseidon* (Doubl.).

Hab. Woodlark Island.

(*f*): **T. priamus urvillianus** (Guér.) [♂, ♀, metam.].

♂. *Papilio urvillianus* Guérin, *Voy. Coquille* t. 13. f. 1. 2 (1829) & text III. p. 273 (1838) (New Ireland).

♂. *Ornithoptera priamus* var., Boisduval, *Voy. Astrolabe. Lép.* p. 35. sub n. 1 (1832) ("Offak" loc. err.).

♂. *Ornithoptera urvilliana*, Boisduval, *Spec. Gén. Lép.* I. p. 175 n. 2. t. 1c. f. 1 (1836) ("Offak" loc. err.); Doubl. Westw. & Hew., *Gen. Diurn. Lép.* I. p. 4. n. 2 (1846); Orbigny, *Dict. d'Hist. Nat. Atl. Zool.* II. *Lép.* t. 1 (1849); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 38. n. 5 (1865) (New Ireland); Butl., *P. Z. S.* p. 288. n. 85 (1874).

♂ ♀. *Ornithoptera urvilliana*, Godman & Salvin, *P. Z. S.* p. 147. n. 32 (1877) (New Ireland or New Britain); id., *l.c.* p. 159. n. 39 (1879) (New Ireland); Oberth., *Et. d'Ent.* IV. p. 30. n. 2 (1879) (Duke of York I.); Mathew, *Tr. Ent. Soc. Lond.* p. 169. t. 6. f. 1 (l.) (1888) (life hist.); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 67. n. 3. (1894) (*curviation*).

♂. *Papilio urvillianus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 4. n. 7. (1852); id., *List Lep. Ins. B. M.* I. p. 3. n. 7 (1856); Feld., *Verh. z. b. Ges. Wien* p. 290. n. 15. & p. 332. n. 11 (1864) (New Ireland).

♂. *Ornithoptera priamus* var. *urvilliana*, Stauding. & Schatz, *Exot. Schmett.* I. p. 4 (1884); Fickert, *Zool. Jahrb.* p. 712. n. 13 (1889).

♂ ♀. *Ornithoptera durvilliana* (?), Woodford, *P. Z. S.* p. 250 (1888) (Solomon Islands).

♂ ♀. *Ornithoptera* (*Priamusptera*, sic!) *urvilliana*, Rippon, *Icon. Ornith.* text & plate (1889).

♂. Blue instead of green.

The blue scaling on the basal half or basal two-thirds of the hindwings above is rather sparse, especially within the cell. The band along the inner margin of the forewings is mostly obsolete, except at the base. There are seldom blue scales on

the median vein. The submarginal spots of the hindwings, nearly always five in number, are large; behind the costal margin there stands a yellow spot of variable size in many individuals, especially often in specimens from the Solomon Islands.

Below, the patch in the cell of the forewings has seldom disappeared. The discocellular veinlets of the hindwings and the median nervure from the apex of the cell to the origin of the lower median branch are black; the breadth of this black nervular line is variable; in the more greenish examples it is apparently thinner than in darker blue specimens.

♀. Resembles the female of *T. priamus poseidon* (Doubl.), but the wings are of a paler brownish colour, and the markings are smaller and more dusted with blackish scales.

The white patch in the cell of the forewings is generally smaller than in *poseidon*, and sometimes obliterated above and below. The second submarginal spot of the hindwings is often prolonged along the subcostal nervule, as in *T. priamus richmondii* (Gray). Below, the markings of the hindwings are sometimes yellowish.

(^l2): ab. loc. *bornemannii* Pagenst.).

♂. *Ornithoptera arruani*, Godman & Salvin (*nec* Felder, 1865), *P. Z. S.* p. 147, n. 31 (1877).

♂ ♀. *Ornithoptera pegasis* var. *bornemannii* Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 65, t. 3, f. 2 (♂) (1894) (New Britain).

Green instead of blue, otherwise the same as *urvillianus*.

This green form seems to be confined to New Britain and New Ireland. I am told by Captain Webster that *urvillianus* is green when emerging from the chrysalis, and that it gradually assumes the blue colour. Individuals which are killed too soon after the emergence from the pupae have that peculiar bluish green or greenish blue colour which Pagenstecher mentions (*l.c.*). In New Britain a number of specimens remain green and have the appearance of *T. priamus poseidon* (Doubl.); they are, however, distinguished from the latter by the band along the inner margin of the forewings above being more or less obsolete, by the median vein of the same wings being covered with a few green scales only, or being quite black, and by the much sparser green scaling of the upperside of the hindwings. This green aberration must certainly be accounted for by atavism. One of my six specimens has only one black spot on the upperside of the hindwings.

In New Britain (and New Ireland?) occur females which are identical with *T. priamus poseidon* (Doubl.), except in being paler brown; these can very well be mated with the green *poseidon*-like males.

Hab. New Britain (6 ♂, 4 ♀); New Ireland (8 ♂, 3 ♀); Duke of York Island (2 ♂, 1 ♀); Solomon Islands (11 ♂, 15 ♀).

2. *Troides croesus* (Wall.) [♂, ♀, metam.].

♂ ♀. *Ornithoptera croesus* Wallace, *Proc. Ent. Soc. Lond.* (2), V, p. 70 (1859) (Batjan); Gray, *P. Z. S.* p. 424, t. 68 (♂), t. 69 (♀) (1859) (Batjan); Feld, *Wien. Ent. Mon.* III, p. 390, n. 31, t. 6, f. 1 (♂) (1859) (Batjan); Wall, *Tr. Linn. Soc. Lond.* XXV, p. 37, n. 3 (1865) (Batjan); Koch, *Indo-Austr. Lep.-Fauna* p. 38 (1865); Oberth, *Et. d'Ent.* IV, p. 30, n. 3 (1879) (Batjan); Ribbe, *Teis* III, p. 42, t. 1, f. 1-3 (*l., p.*) (1890) (Batjan; hfc hist.).

♂ ♀. *Ornithoptera* (*Priamusptera*, sic!) *croesus*, Rippon, *Icon. Ornith.* text (*p.p.*) & plate (1889).

♂ ♀. *Papilio croesus*, Felder, *Verh. z. b. Ges. Wien* p. 290, n. 20, & p. 333, n. 15 (1861) (Batjan).

♂ ♀. *Ornithoptera priamus* var. *croesus*, Stauding. & Schatz, *Exot. Schmett.* I, p. 4, t. 1 (♂) (1881); Fickert, *Zool. Jahrb.* p. 709, n. 11 (1889); Stauding. & Schatz, *l.c.* II, p. 41 (1892).

As this insect does not differ from *T. priamus* except in colour (♂) and pattern (♀), one might be justified in regarding it as being only a local form of that species:

and there is, indeed, no doubt that *croesus*, *lydius*, and *priamus* have developed from one ancestral form, which was similar either to the orange *croesus* and *lydius*, or to the green *priamus*. But the orange and the green *Troides* seem to me to be already so far separated in their characters that they cannot be united under one specific name. My reasons for treating *croesus* as a distinct species are as follows:—

(1) The caterpillar of *croesus* has on each side two white oblique streaks, while in the races of *priamus* there is only one or no stripe. Ribbe, *Iris* III. p. 42 (1890), says, however, of *T. priamus poseidon* (Doubl.) that the caterpillars “mostly” have only one stripe, from which I must conclude that they have sometimes two. If Ribbe’s observations are correct, there is no great difference between the caterpillars of *croesus* and *priamus*. Considering, however, that the caterpillars of *T. victoriae* (Gray) and *paradiseus* (Stauding.) do also not differ from those of *priamus* except in having no white streak at all (in which character they agree with the Australian races of *priamus*), and that the chrysalides of *urevillianus* and *victoriae*, which I have before me (collected by Captain Webster), do not exhibit any difference worthy of note, we come to the conclusion that we cannot derive any essential specific characters from the early stages of these *Troides*: indeed, the similarity in larvae and pupae proves that all these species are close relatives; that the characters distinguishing the *imagines* have been most probably acquired in comparatively recent ages; and that perhaps there exist species, still unknown to us, which stand intermediate in neuration between *victoriae* and *paradiseus* on one side, and *priamus*, *croesus*, and *lydius* on the other.

(2) There are no intermediate specimens between the *males* of *croesus* and *priamus*. Sometimes the hindwings are partly green above, but such specimens have been reared and were killed too soon after the emergence from the pupa. There exist certainly no individuals in collections which cannot be recognised at once as belonging to *croesus*.

(3) The *female* is constantly different from that of *priamus*; truly intergraduate specimens are again unknown.

We do not know the insects from the island of Ohi, which lies between the Southern and Northern Moluccas—this large island may be inhabited by a race of *Troides* connecting *croesus* with *priamus*.

♂. Above, orange instead of green.

There is usually no band along the hinder margin of the forewings above; but some individuals have a feeble orange patch near the hind angle, and in others there are orange scales scattered all along the inner margin of the wing. The number of the black spots on the hindwings above varies from 0 to 5.

♀. The wedge-shaped whitish markings of the hindwings above reach rather close to the cell and the outer margin; they are separated from one another by the nervules, which are rather broadly brownish black; the black spots within the wedge-shaped markings are so increased in size that at least the two anterior of the wedge-shaped marks are widely separated into a discal and a submarginal portion.

The white spots of the forewings are small; the patch within the cell is often reduced [as in *T. priamus euphorion* (Gray)] to two small spots, or is even absent. The number of the spots is very variable; sometimes there are two complete rows of markings; the discal row is much more liable to obliteration than the submarginal one. The cell of the hindwings has occasionally a white spot at the apex. The submarginal markings of the hindwings below are often of a rather pure yellow colour.

Hab. Batjan (W. Doherty, March 1892) (13 ♂, 9 ♀).

3. *Troides lydius* (Feld.) [♂, ♀]

- ♂ ♀. *Papilio lydius* Felder, *Reise Novara, Lep.* I. p. 9 n. 5, t. 3, f. a (♂), b (♀) (1865) (Halmahera).
- ♂ ♀. *Ornithoptera croesus* local form *a*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 37, sub n. 3 (1865) (Ternate, ♂; Gilolo, ♀).
- ♂ ♀. *Ornithoptera lydius*, Oberthür, *Et. d'Ent.* IV. p. 30, n. 4 (1879) (Halmahera); id., *Ann. Mus. Civ. Genova* XV. p. 468, n. 2 (1880) (Ternate).
- ♂ ♀. *Ornithoptera priamus* var. *lydius*, Stauding. & Schatz, *Exot. Schmett.* I. p. 4 (1888); Fickert, *Zool. Jahrb.* p. 711, t. 20, f. 5 (♀) (1889) (Halmahera).
- ♂ ♀. *Ornithoptera (Priamusptera) croesus*, Rippon, *Icon. Ornith.* text (1889) (p.p.).
- ♂ ♀. *Ornithoptera (Priamusptera) lydius*, Rippon, *l.c.* text & plate (1892).

Some of my readers will be surprised to see that I treat *lydius* as a distinct species. My reasons for doing so are these:—

The *male*, of which I have compared five specimens, is always distinguishable from *croesus* by the much larger green mark in the cell of the forewings below, by the antecellular yellow mark of the hindwings below occupying the whole cellule between the costal and subcostal veins and extending beyond the costal vein, its outline being thus quite different to that of *croesus*, and by the subcostal and discocellular veins of the hindwings below being extremely narrowly black; in *croesus* the subcostal and median nervures and the discocellular veinlets have a black border of almost even breadth.

The *female* has all the whitish markings much enlarged, the white being by far the predominant colour; nearly the whole discoidal cells of the fore- and hindwings are whitish; the whitish markings are much clouded with black scales.

As these differences are constant in about ten specimens of *lydius* which I could examine, and as there are no intergradations known, I do not see why *lydius* must be treated as a subspecies of *croesus*.

♂. The fiery orange colour of the type-specimen is not constant; fresh specimens are sometimes less fiery than *croesus*. The breadth of the costal band of the forewings is also very variable; in my second specimen this band is broader than in many examples of *croesus*; this individual has some orange scales scattered along the abdominal margin of the forewings, and a small submarginal orange spot upon the upper median nervule.

♀. The amount of white within the discoidal cell of either wing is not quite constant; the two white spots behind the third subcostal nervule of the forewings above are sometimes merged together.

The orange *male* from Ternate, caught by Wallace, now in the Hewitson Collection in the British Museum, is mentioned as a form of *T. croesus* by Rippon, but, although not typical, clearly belongs to *T. lydius*.

Hab. Halmahera (2 ♂, 3 ♀); Ternate (1 ♂ in Hewitson coll.).

Note.—I have endeavoured to find structural differences between *T. priamus*, *croesus*, and *lydius*, but did not meet with much success. The *female* of *lydius* is somewhat different in scaling from *croesus* and *priamus*: the black scales with which the white spots on the upper side of the forewings are eloned are of normal form, being as broad and long as the scales of the black portions of the wing. In *croesus* and *priamus*, however, these scales are elongated, often linear, with the apical teeth sometimes obsolete. This difference in scaling seems to me to be worthy of note, as

it can serve to prove that the *female* of *lydius* stands nearer the ancestral form of the insects in question than the *females* of the other species do [cf. Haase, *Untersuch. üb. Min.* p. 24 (1893); Fickert, *Zool. Jahrbüch.* p. 714 (1889)]. Rippon, in his non-critical (to say the least) monograph of *Troides*, expresses the opposite opinion—namely, that the *female* of *lydius*, having a “danaoid” and “acreoid” appearance, is a (younger) modification of the *females* of *croesus* and *priamus*, and “bears unmistakable evidence of its being intended as a mimic of some danaoid or acreoid species, probably as a means of protection.”

The green scales on the upperside of the forewings of *priamus*, and the orange ones of *croesus* and *lydius*, are of the same form in these three insects, and differ in shape obviously from those of *tithonus* and *paradiseus*. In *paradiseus* they are rather short, rectangular, with the angles themselves rounded; in *tithonus* they have the same rectangular form, but are longer, and their apex is more rounded; in *priamus*, *croesus*, and *lydius* they are obviously narrowed towards the apex; *victoriae* holds in this respect an intermediate position.

The abdominal fold of the hindwings bears on the underside, upon the submedian nervure, long and densely set hairs in all the species of *Troides* (*priamus* group and *helena* group), which character is absent from all the Eastern *Papilio*s, and has also a peculiar scaling, with which I did not meet in any species of *Papilio*, except *P. aidoneus* Doubl. The scales of the underside of the abdominal fold are broadest towards the base, and regularly produced at the apex in two very long teeth in *paradiseus* (Stauding.), *victoriae* (Gray), *tithonus* (De Haan), *priamus* (L.), *croesus* (Wall.), *lydius* (Feld.), and *hypolitus* (Cram.); the species allied to *helena* (L.) and *amphrysus* (Cram.) (Swainson's genus *Amphrissus*) differ in the scales having partly three long teeth; in *brookianus* (Wall.) most of the scales have three or four teeth. In *paradiseus* these scales stand rather widely separated from one another, the membrane of the wing being visible between them. In the genus *Papilio* the scales of the abdominal fold of the hindwings are either identical with those on the disc of the wing, or, if different, are rounded, or irregularly and shortly toothed; except in *P. aidoneus* Doubl., where they are similar to those of *T. brookianus* (Wall.).

The scaling on the disc of the forewings of the *male* of *T. victoriae* (Gray) has a peculiar gloss. While on the black, not glossy, portion of the wing the scales are arranged in transverse series, and whilst here the upper scales are narrower than those of the under layer, in the glossy area the serial arrangement has become irregular, chiefly in consequence of the upper scales having assumed the broad form of the under scales. I may add that the black scales of the upperside of the forewings of *victoriae* are not, or feebly, toothed, especially those of the upper layer, which come very close in shape to the non-dentate metallic scales.—K. J.

4. *Troides tithonus* (De Haan) [σ , φ].

- σ . *Ornithoptera tithonus* De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 18. t. 1. f. 1 (σ) (1840) (New Guinea: probably erroneous); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 4 (1846); Vollenhov., *Tijdschr. v. Ent.* III. p. 71. n. 3 (1860).
- σ . *Papilio tithonus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 5. n. 8 (1852); id., *List Lep. Ins. B. M.* I. p. 3. n. 8 (1856); Feld., *Verh. z. b. Ges. Wien* p. 290. n. 6. & p. 331. n. 4 (1864).
- φ . *Ornithoptera tithonus*, Oberthür, *Bull. Soc. Ent. France* p. 122 (1885) (Waigen); id., *Et. d'Ent.* XII. p. 1. n. 1. t. 3. f. 10 (φ) (1888) (Waigen).
- σ φ . *Ornithoptera tithonus*, Fickert, *Zool. Jahrbüch.* p. 720. t. 20. f. 6 (σ). t. 21. f. 1 (φ) (1889) (Waigen); Standing., *Iris* VI. p. 355 (1894) (Waigen).

In neuration, especially in the position of the third subcostal branch of the forewings, this species is closely allied to *T. priamus* (L.); in pattern and in the

absence of the "brand" from the forewings of the *male* it comes nearest to *T. paradiseus* (Standing.).

♂. One of my two specimens has two yellow spots within the yellowish green costal band of the forewings. The three submarginal spots and the yellow markings of the hindwings vary in size.

♀. The number and size of the white spots of the forewings are inconstant; the markings on the disc behind the cell are especially liable to obliteration. The white, internervular, marginal fringe is often much reduced.

Hab. Waigeu (2 ♂, 1 ♀); [New Guinea?, probably erroneous].

5. *Troides paradiseus* (Standing.) [♂, ♀, larva, pupa].

♂. *Ornithoptera paradisæa* Staudinger, *Ent. Nachr.* p. 177 (June 1893) (German New Guinea); *id.*, *Iris* VII. p. 350, t. 6, f. 1 (♂) (1894).

♂ ♀. *Ornithoptera schoenbergi* Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 29. & 83, t. 2/3 (♂), t. 4 (♀) (1893) (Finisterre Mts.); *id.*, *l.c.* p. 70 (1894) (*larva noticed*).

♂. *Schoenbergia paradisæa* Pagenstecher, *l.c.* p. 35 (1893).

♂ ♀. *Schoenbergia* (?) *paradisæa*, Rippon, *Icon. Ornith.* text (1895).

♂ ♀. *Schoenbergia paradisæa*, Rippon, *l.c.* text & plate (1895) [*Sch. paradisæa* Pagenstecher and "Rippon" (*sic!*) on plate].

The third subcostal nervule of the forewings originates exactly at the apex of the cell.

♂. The hindwings are prolonged into a thin, long tail; forewings without "brand."

♀. The marginal white spots are restricted to the marginal fringe itself, and are, therefore, much smaller than in *T. priamus* (L.). The white markings of the wings not quite constant.

Caterpillar similar to that of *T. victoriæ* (Gray).

Hab. German New Guinea (2 ♂, 2 ♀).

6. *Troides victoriæ* (Gray) [♂, ♀, larva, pupa].

♀. *Ornithoptera victoriæ* (Gray), *P. Z. S.* p. 7, t. 39 (♀) (1856) (*Patria?*); *id.*, *List Lep. Ins. B. M.* 1, p. 3, n. 9 (1856); *Butl.*, *P. Z. S.* p. 289, n. 88 (1874).

♀. *Papilio victoriæ*, Felder, *Verh. z. b. Ges. Wien* p. 290, n. 7, & p. 332, n. 5 (1864) (Oceania).

♂ ♀. *Ornithoptera victoriæ*, Salvin, *P. Z. S.* p. 118, n. 2, t. 4 (♂ & larv.) (1888) (Guadalcanar, Solomon Is.); Woodford, *ibid.* p. 250 (1888); Fickert, *Zool. Jahrbüch.* p. 722, t. 21, f. 2 (♂).

3 (♀) (1889); Haase, *Untersuch. üb. Mim.* p. 24 (1893).

♂ ♀. *Troides victoriæ*, Rothschild, *Entomol.* XXVIII. p. 78 (1895) (Guadalcanar).

♂ ♀. *Acteoptera victoriæ*, Rippon, *Icon. Ornith.* text & plates (1895).

As this species has already been found on Guadalcanar, Maleita, the Shortland Islands, and on Bougainville I. (Mr. Woodford also saw a *male* in the Rubiana Lagoon), it is most probable that it occurs on all the islands of the Solomon group. The specimens from different islands exhibit some obvious differences and form three local races, which number will certainly be increased in future, when we know the insects from the islands of Choiseul, San Christoval, etc.

(a): *T. victoriæ* (Gray) inhabits Guadalcanar;

(b): *T. victoriæ reginæ* (Salv.) occurs on Maleita;

(c): *T. victoriæ regis* Rothschild, was discovered on Bougainville and Alu.

The type of *victoriæ* came undoubtedly from Guadalcanar Island, as Mr. O. Salvin (*l.c.*) has pointed out.

The third subcostal branch of the forewings originates mostly beyond the apex of the cell; sometimes it stands at the apex of the cell, as in *T. paradisæus* (Standing.);

the common stem of the fourth and fifth subcostal nervules is long, but rather variable. The apical part of the discoidal cell of the forewings is very broad, especially in the *male*. The latter sex has a "brand," though Haase (*l.c.*) says that this sexual character is absent from *victoriae*. The hindwings of the *female* are much more hairy than in the allied species.

(a): **T. victoriae** (Gray), forma typ. [σ , φ , larva].

σ . The yellowish green apical patch on the upperside of the forewings consists of three spots, of which the first varies in length from 14 to 20 mm., while the third has mostly a length of 7 and a breadth of 5 mm., or is smaller.

φ . The *female* is less constant than the *male*. The two spots within the cell of the forewings are often joined to one another, and sometimes merged together to a large triangular patch which occupies the basal two-thirds of the cell.

Hub. Guadalcanar Island (6 σ , 8 φ).

(b): **T. victoriae reginae** (Salv.) [σ , φ].

σ φ . *Ornithoptera victoriae*, Godman & Salvin (*ver* Gray, 1856), *P. Z. S.* p. 190 (1887) (Maleita); Grose Smith, *Ann. Mag. N. H.* (5) XIX. p. 445 (σ) (1887) (Maleita); id. & Kirby, *Rhop. Exot. I. Ornith.* t. 1. f. 1 (σ). 2 (φ) (1887) (Maleita).

σ φ . *Ornithoptera reginae* Salvin, *P. Z. S.* p. 117. n. 1. (1888) (Maleita); Fickert, *Zool. Jahrb.* p. 723. t. 21. f. 4 (φ) (1889).

σ φ . *Troides victoriae reginae*, Rothschild, *Entomol.* XXVIII. p. 78 (1895) (Maleita).

σ φ . *Aethoptera reginae*, Rippon, *Icon. Ornith.* text & plate (1895) (Maleita: "Fiji" *loc. err.*).

The neuration in Fickert's figure is incorrect, and Dr. Fickert is quite mistaken in stating that the third subcostal nervule of the forewings has in *victoriae* the same position as in *prianus* (L.).

σ . The subapical golden green patch of the upperside of the forewings consists of three large and a fourth small spot; the third spot is as large as the second of *victoriae*, and measures in length 16 mm., in breadth 5 mm.; the patch is sometimes connected with the basal green area of the wing, which is more extended than in *victoriae*, by means of a narrow, postcostal band. On the hindwings, between the discoidal cell and the submarginal spots and behind the cell, the green scales are sparse or quite absent.

φ . All the white markings are larger than in *victoriae*; the third subapical spot of the forewings, situated behind the fifth subcostal nervule, measures, for example, in length 16 mm., in breadth 5 mm., the last submarginal spots 16 and 14 respectively, while in *victoriae* the respective measurements are: length from 6 to 11, breadth 4; and length 3 to 8, breadth 6 to 10 mm.

Hub. Maleita Island (1 σ , 3 φ).

(c): **T. victoriae regis** Rothschild. [σ , φ , pupa].

(?). φ . *Ornithoptera victoriae* var., Salvin, *P. Z. S.* p. 118. sub n. 2 (1888) (Florida Island, *loc. err.*?).

σ φ . *Troides victoriae regis* Rothschild, *Entomol.* XXVIII. p. 78 (1895) (Bougainville & Alu).

σ . The subapical patch of the forewings very long, consisting of two large spots, and a narrow streak or small spot behind the fifth subcostal nervule. The green area of the hindwings as in *victoriae*, or as in *reginae*; the anterior submarginal yellow spot is obliterated in the type-specimen.

φ . The submarginal spots of either wing much smaller than in *victoriae*, partly obliterated; discal spots and those at the base of the fore- and hindwings also smaller

than in the other two subspecies. In one of my four individuals there stands a small black spot within the first (costal) marking of the discal row of spots of the hindwings.

The dry pupa does not differ from that of *T. priamus arevillianus* (Génér.).

Hab. Bougainville Island (C. Ribbe *leg.*, 1891: 3 ♂, 4 ♀); Alu (1 ♂, Captain Webster *leg.*).

The Alu *male* approaches a little the typical form of the species.

Mr. Rippon (*l.c.*) quotes my authority as to the one ♀ and the ♂ of *T. victorius reginae* in my collection being from Fiji. This I do not now believe to be the case. The following is the history of the two specimens:—I purchased them from the family of a captain of a merchant vessel, who asserted that the specimens had been captured in Fiji, where he, with his wife, had resided for many years; now there is no record of a *Troides* captured in Fiji by any *reliable* collector, and therefore I believe the owner of these brought them home to Fiji from a voyage to the Solomons. This is the more likely as it is most improbable that two so distant places as Maleita and Fiji should have identical forms, while Guadalcanar, scarcely separate from Maleita, has a different one.

7. *Troides brookianus* (Wall.) [♂, ♀].

(?) *Ornithoptera brookiana* Becker, *Bull. Soc. Ent. France* p. 21 (Févr. 1855) (*nom. nud.*).

(?) *Ornithoptera brookea* Stevens, *ibid.* p. 89 (1855) (*nom. nud.*).

Ornithoptera brookiana Wallace, *Proc. Ent. Soc. Lond.* (2), III. p. 104 (♂) (1855) (Borneo); Standing & Schatz, *Exot. Schmett.* I. p. 5. t. 2 (♂) (1884).

Ornithoptera brookeana Hewitson, *Exot. Butt. I. Orn. & Pap.* t. 1. f. 1 (♂) (1855) (Borneo); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 40. n. 16 (1865) (Borneo); Cutter, *Proc. Ent. Soc. Lond.* p. 21 (♀) (1869); Oberth., *Et. d'Ent.* IV. p. 32. n. 17 (1879) (Borneo); Dist., *Ent. Mo. Mag.* p. 237 (1881); Forbes, *Naturalist's Wanderings* p. 227 (1885) (Sumatra); Dist., *Rhop. Mal.* p. 467. sub n. 4 (1886) (Sumatra); id. & Pryer, *Ann. Mag. N. H.* (5), XIX. p. 272. n. 166 (1887) (Sandakan); Pickert, *Zool. Jahrb.* p. 749 (*acc fig.*) (1889) (Borneo; Sumatra; *acc* Malacca); Skertchley, *Ann. Mag. N. H.* (6), IV. p. 209 (1889) (Borneo; *habits*); Hagen, *Iris* VII. p. 18 n. 1 (1894) (Sumatra: ♀ *noticed*).

Papilio trogon Vollenhoven, *Pijdschr. v. Ent.* III. p. 72. n. 9. & p. 88. t. 6 (♂) (1860) (Sumatra).

Papilio brookeanus, Felder, *Verh. z. b. Ges. Wien* p. 292. n. 35. & p. 334. n. 23 (1865) (Borneo; Sumatra); Snellen, *Midden-Sumatra*, II. p. 24. n. 1 (1892) (Sumatra).

Ornithoptera (Trogonoptera) brookiana, Rippon, *Icon. Ornith.* text & plate (1889) ("Trogonoptera" *subgenus nov.*).

This species ranges over the Malay Peninsula, Sumatra, the Natuna Islands, Borneo, and the Island of Balabac; on Palawan it is represented by *T. trojanus* Stauding. As the *females* from the Malay Peninsula are always different from those from the other localities, I must divide *T. brookianus* into two subspecies:—

(a): *T. brookianus* Wall., inhabiting Borneo, Balabac, Natuna Islands, and Sumatra;

(b): *T. brookianus albescens* subsp. nov. from Malacca.

(a): **T. brookianus** (Wall.), forma typ. [♂, ♀].

♂. The *upperside* is very constant, though the green markings are not always of exactly the same shape in my individuals.

Below, however, the *male* varies a good deal in the amount of bluish green or greenish blue. In most individuals there is no blue or greenish blue mark within the cell of the forewings; other examples have a small spot there, while in the specimen from Balabac in my collection there is a large greenish blue patch, as in the *female*. The forewings exhibit sometimes a series of white submarginal spots standing in pairs at

the nervules. The size and form of the white markings in the outer region of the hindwings is very variable.

♀. The posterior part of the hastate mark divided by the lower discoidal nervule of the forewings above is often green instead of white. The underside exhibits some variation, especially in the size of the white markings; those of the hindwings are joined to one another, or widely separated. The ♀ from the Natuna Islands stands just intermediate between the typical form and *T. brookianus albescens* mihi, having the white markings of the underside larger than they are in *brookianus*, and smaller than in *albescens*.

(a²): ♀-ab. *eleanor* (Walker).

Ornithoptera brookiana var. *eleanor* Walker, *Tr. Ent. Soc. Lond.* p. 75 (1889) (no locality!); Rippon, *Icon. Ornith. text & plate* (1889).

This remarkable aberration has the upperside of the forewings almost exactly marked as the *male*; the white subapical markings of the usual form of the *female* are absent. Locality unknown.

Hab. Borneo (14 ♂, 10 ♀); Balabac (1 ♂); Sumatra (1 ♂; ♀ in Coll. Van de Poll and in Mus. Stettin); Natuna Islands (Bunguran; 1 ♂, 1 ♀).

(b): ***T. brookianus albescens*** subsp. nov. [♂, ♀].

Ornithoptera brookiana Gosse (nec Wallace, 1855), *Entom.* p. 156 (♀) (1881) (Mal. Pen.); Dist., *Ent. Mo. Mag.* XVII, p. 237 (1881) (Mal. Pen.); id., *Rhop. Mal.* p. 330, n. 4, t. 27a, f. 4 (♀), & t. 27b, f. 1 (♂) (1885) (Mal. Pen.); Fickert, *Zool. Jahrb.* p. 749 (ex p.), t. 21, f. 8 (♀) (1889).

♂. Not distinguishable from typical *brookianus*, though on an average the white spots on the underside of the forewings seem to be larger.

♀. *Upperside*: the subapical white markings of the forewings larger than in *T. brookianus*, much less suffused with blackish brown, being pure white in the middle; the submarginal spots to the hindwings are longer, extending from near the outer margin more than half-way to the cell.

Underside: the submarginal white markings of the forewings are broad and touch one another, not being widely separated at the internervular folds. On the hindwings the white submarginal area is much more extended than in *brookianus*, forming a broad white band, which is traversed by rather thinly black nervules and includes a black rounded spot within each cellule; these spots are sometimes connected with the black disc of the wing by means of an internervular black streak; in *brookianus* ♀ the discal portion of the white band is obliterated, except at the veins.

Hab. Malay Pen. (14 ♂, 3 ♀).

8. ***Troides trojanus*** (Standing.) [♂, ♀].

♂. *Ornithoptera trojana* (an *brookiana* var.?) Staudinger, *Iris* II p. 4 (♂) (1889) (Palawan); Fickert, *Zool. Jahrbüch.* p. 764 (1889); Watkins, *Entom.* XXIV, p. 177, t. 1 (♂) (1891); Semper, *Philipp., Tagfal.* p. 263, n. 384 (1891) (Palawan).

The differences between *T. trojanus* and *T. brookianus* are so considerable, and apparently so constant, that I must treat *trojanus* as a distinct species. It is, however, not impossible that further investigations in Palawan, which may enable us to compare a larger series of specimens, will prove that at least the *females* of both species run into one another.

♂. The blue-green markings of the upperside of the forewings are short and widely separated. The hindwings have a rather narrow, greenish blue, discal band above.

♀. *Upperside*: in the amount of white on both sides of the forewings it comes nearest to *T. brookianus albescens*: above there are three green hastate patches,

situated on the submedian nervure and the two lower median nervules. Hindwings with a complete series of submarginal white markings, which are as short as in *brookianus* Wall., but purer white; the blue area is exteriorly much more restricted than in *brookianus*, as it does not extend farther than one-third of the way from the cell to the outer margin of the wing.

Underside: forewings with a faint bluish mark within the cell, a green spot between the lower median nervules, and a large blue and green patch within the cellule between the submedian nervure and the lower median vein.

Hindwings with the white markings somewhat larger than in *brookianus*, and standing farther from the outer margin.

Hab. Palawan (3 ♂, 1 ♀).

9. *Troides hypolitus* (Cram.) [♂, ♀].

- Seba, *Thes.* IV. p. 55. t. 45. f. 17-20 (Amboina !), & p. 56. 57. t. 46. f. 11. 12. 19. 20 (1765).
 ♀. *Papilio Eques Trojanus panthous* Linné, *Syst. Nat.* ed. x. p. 461. n. 16 (1758) (*p.p.*); Clerck, *Icon. Ins.* II. t. 18 (1764) (*non fig. tab. 19 quæ ad ♀ T. priami (L.) pertinet*); Linné, *Mus. Lud. Ulr.* p. 195. n. 14 (1764) (*p.p.*); id., *Syst. Nat.* ed. xii. p. 748. n. 17 (1767) (*p.p.*); Müller, *Naturs.* V. 1. p. 571. n. 17 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 448. n. 25 (1775) (*p.p.*); Goeze, *Ent. Beytr.* III. 1. p. 37. n. 17 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 9. n. 36 (1781) (*p.p.*).
Papilio Eques Trojanus pandorus, Houttuyn (*non* Linné, 1758), *Naturl. Hist.* I. 11. p. 199. n. 17 (1767) (*p.p.*).
 ♂ ♀. *Papilio Eques Trojanus hypolitus* Cramer, *Pap. Erot.* I. p. 14. t. 10. f. a. b (♂); t. 11. f. a. b (♀) (1775) (Amboina).
 ♂ ♀. *Papilio Eques Trojanus remus*, Fabricius, *Græca Ins.* p. 250 (1777); Cramer, *Pap. Exot.* II. p. 60. t. 135. f. a (♀) & p. 61. t. 136. f. a (♂) (1779); id., *l.c.* IV. p. 197. t. 386. f. a. b (♂) (1782); Jablonsky, *Naturs. Schmetz.* I. p. 198. n. 3. t. 2. f. 1. 2 (1782); Fabr., *Mant. Ins.* II. p. 3. n. 24 (1787); Esper, *Aust. Schm.* p. 67. n. 31. t. 17 (♀) (1790); Gmelin, *Syst. Nat.* I. 5. p. 2230. n. 288 (1790); Fabr., *Ent. Syst.* III. 1. p. 11. n. 34 (1793) (Amboina).
 ♂. *Papilio Eques Trojanus antenor*, Well (*non* Drury, 1793), in Jaquin, *Miscell. Austr.* II. t. 23. f. 4. a. b (1785).
 ♂. *Papilio Eques Trojanus hippolytus*, Esper, *Aust. Schmetz.* p. 72. n. 32 (1790).
 ♂. *Papilio Eques Trojanus hippolytus*, Esper, *l.c.* t. 18. f. 1 (♂) (1790).
 ♂ ♀. *Papilio panthous*, Donovan, *Ins. of India* t. 18 (♀) (1800); Gray, *Cat. Lep. Ins. B. M.* I. p. 5. n. 9 (1852) (Amboina); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 234. n. 2 (1869) (Amboina); Auriv., *Konigl. Sc. Vet. Ak. Handl.* XIX. 5. p. 19. n. 14a (1882).
 ♀. *Princeps dominans hypolitus*, Hübner, *Summl. Ecot. Schm.* I. t. 132. f. 3. & t. 133. f. 4 (♀) (1806-16).
 ♂ ♀. *Troides remus*, Hübner, *Verz. bek. Schm.* p. 88. n. 925 (1816).
 ♂ ♀. *Papilio remus*, Godart, *Enc. Méth.* IX. p. 26. n. 3 (1819); Thon, *Naturg. Schmetz.* p. 17. t. 4. f. 5 (♀) (1837); Feld, *Verh. z. h. Ges. Wien* p. 291. n. 21. & p. 333. n. 18 (1861) (Amboina, Ceram, Ternate; *non* Celebes, *subspec. alt.*).
 ♂ ♀. *Ornithoptera remus*, Boisduval, *Spec. Gén. Lép.* I. p. 176. n. 3 (1836) (Amboina); Duncan, *Foreign Butterfl.* p. 92. t. 1. f. 2 (1837); Vollenhov., *Tijdschr. v. Ent.* III. p. 71. n. 4 (1860) (Amboina); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 38. n. 6 (1865) (Amboina, Ceram, Gilolo, Morty; *non* Sulla Islands, *non* Celebes); Obertb., *Et. d'Ent.* IV. p. 30. n. 5 (1879) (Amboina; *non* Celebes, *subspec. alt.*).
 ♂ ♀. *Ornithoptera panthous*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 5 (1846) (Amboina).
 ♂ ♀. *Ornithoptera hippolytus*, Stauding, & Schatz, *Exot. Schmetz.* I. p. 5. t. 2 (♂) (1881); Pagenstechl., *Jahrb. Nass. Ver. Nat.* p. 201 (1884) (*p.p.*); Fickert, *Zool. Jahrbüch.* p. 741. n. 11 (1889) (*p.p.*); Ribbe, *Iris* II. p. 207. n. 2 (1890) (Ceram).
 ♂ ♀. *Ornithoptera (Pompeusptera, Pompeuspterus, Pomproptera ! !) hippolytus*, Rippon, *Icon. Ornith.* text & plate (1889) (*p.p.*).

Aurivillius (*l.c.*) and several other authors apply the name of *panthous* (L.) to this insect; they are, however, wrong in doing so. Linné describes in *Syst. Nat.* ed. x. (1758) his *P. E. T. panthous* thus:—*Alis dentatis nigris concoloribus; primoribus albo maculatis; posticis maculis albis nigro foetis.* M. L. U.

This description fits certainly best to the *female* of *priamus* (L.), which has white maculae on the forewings, and white maculae with black centres on the hindwings.

In *Mus. Lud. Ur.* (1764) Linné describes as *pantous* two *female* insects, one after the other, which he mates as ♂ and ♀: the "♂," which is the first described, is said to have the wings black with white maculae, and is the same as the ♀ of *T. priamus* (L.), which latter insect has been described previous to *pantous*; the other insect, the supposed ♀ ("*sexus alter*, etc."), is described as having the forewings striped with white, the stripes being united in pairs at their bases, and as having seven maculae upon the hindwings, of which the four anterior ones are yellow, the three posterior white.*

This "♀" is certainly the ♀ of the insect named by Cramer *hypolitus* and by Fabricius *remus*. Now, Aurivillius (*l.c.*) says that the name of *pantous* must be restricted to the insect characterised as "*sexus alter*, etc.," *i.e.* to Cramer's *hypolitus*, because, if it has been proved that part of a composite species belongs to a previously described insect, the new name has to stand for the rest of that composite species. This is certainly right in some cases; but in the present one it would be directly against the law of priority. In the description of 1758 there is nothing which points to any other species than to the *female* of *priamus*; I must strictly deny that the *pantous* of 1758 is to be regarded as being a composite species. The description of 1764 proves again that the name of *pantous* must be applied to the *priamus* ♀, the latter being the first described of the two insects which Linné united to one species; it does not matter at all whether two or more species described under the same name, by the same author, are published on the same page, or in the same volume, or whether there is an interval of years between the publications of the descriptions—the name must always be restricted to that insect which is first described, and if this first-described species has already an older name (as in the present case), the name of the composite species sinks into a synonym.

Cramer's name of *hypolitus* (not *hippolytus*, *hippolythus*) is based on Seba's bad figures of plate 46; Cramer's figures (*l.c.* t. 10 and 11) show all the errors of neuration and pattern of Seba's figures, and are certainly nothing but copies of the latter. Specimens agreeing in pattern with Seba's figures of plate 46 are unknown, and I am convinced that Seba had not a variety of the ♂ of the well-known Moluccan insect, as suggested by several authors, but a mutilated specimen which did not show the exact shape and position of the submarginal spots of the hindwings; in Seba's fig. 19 the left hindwing is different in pattern from the right one. The figures are, however, well recognisable as representing the same species described two years later, under the name of *remus*, by Fabricius.

Cramer gives as "*patria*" of his *hypolitus* Amboina; Seba says (t. 46). "*Indiae orientales*"; to the figures of plate 45, which represent the same species, Seba gives however as habitat Amboina: "*Varietates hujus Papilionis descriptae sunt pluresque deinceps sequentur*," and "*haec et, quae sequuntur, ejusdem speciei varietates omnes Amboinenses sunt*." From these and some other remarks in Seba, it is pretty clear that all the specimens of the present species figured by Seba were from Amboina. [Compare also Wallace, *Proc. Ent. Soc. Lond.* V. p. 23 (1858)].

Troides hypolitus (Cram.), which is very remarkable for its pattern and the form of the discoidal cell to the hindwings, has developed into three subspecies, namely:—

* Linné says of the maculae 2. 3. 1: "*Flavae, in medio macula alba*"; correctly it ought to be "*macula nigra*."

(a) : *T. hypolitus* (Cram.) from the Moluccas ;

(b) : *T. hypolitus sulaensis* (Standing.) from the Sula Islands ;

(c) : *T. hypolitus cellularis* nom. nov. from Celebes.

Wallace records *T. hypolitus* from Halmahera and Morty; I have not seen specimens from there, and am convinced that these islands are not inhabited by typical *hypolitus*.

(a) : **T. hypolitus** (Cram.), forma typ. [♂, ♀].

♂. The yellow markings on the hindwings are not constant in size; above, the three anterior ones are of the breadth of the respective cellules; the fourth, however, is often separated in two spots, of which the first stands behind the lower discoidal vein, the second, sometimes scarcely indicated, at the first median nervule; to the geminate mark at the second median branch a small spot at the lower median vein is joined in some examples, while from other individuals this spot is absent. Below, the anterior yellow markings are somewhat smaller than on the upperside; that at the extremity of the third median branch is always present.

♀. The black spots included in the yellow markings of the hindwings are sometimes rather enlarged, especially those between the subcostal and upper median veins on the underside. The white spot in the apex of the cell to the hindwings below is often rather small; above, this mark is mostly indicated by a white scaling, which is densely covered by black scales.

Hab. Amboina (7 ♂, 8 ♀); Ceram (1 ♂). [Halmahera, Morty, *acc. to Wallace*].

(b) : **T. hypolitus sulaensis** (Standing.) [♂, ♀].

Ornithoptera venus, Wallace (*acc. Fabricius*, 1777), *Tr. Linn. Soc. Lond.* XXV. p. 38. n. 6 (1865) (*p.p.*; Sula Is.).

♂ ♀. *Ornithoptera hippolytus* var. *sulaensis* Standinger, *Iris* VII. p. 313 (1895) (Mangola I., Sula Is.).

♂. The median branches of the forewings above are mostly bordered with yellowish instead of white scales. The white area of the hindwings below is tinged with yellow in most specimens; the marginal cloud of whitish scales between the costal and subcostal veins of the same wings is absent or only indicated. The abdomen is seldom white instead of yellow.

♀. The hindwings are much yellower between the median branches than in *hypolitus*; below, the white scaling in the apex of the discoidal is much reduced.

Hab. Mangola, Sula Islands (3 ♂, 2 ♀).

(c) : **T. hypolitus cellularis** nom. nov. [♂, ♀].

Papilio venus, Felder (*acc. Fabricius*, 1777), *Verh. z. b. Ges. Wien* p. 291. n. 21. & p. 333. n. 18 (1864) (*p.p.*; Celebes).

Ornithoptera venus, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 33. n. 6 (1865) (*p.p.*; Celebes); Oberth., *Et. d'Ent.* IV. p. 30. n. 5 (1879) (*p.p.*; Celebes).

Ornithoptera hypolitus, Hopffer (*acc. Cramer*, 1775), *Stett. Ent. Zeit.* p. 17. n. 1 (1874) (Celebes).

Ornithoptera hippolytus, Standing. & Schatz (*acc. Esper*, 1790), *Erst. Schmett.* I. p. 5 (1884) (*p.p.*; Celebes); Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 201 (1884) (*p.p.*); Fickert, *Zool. Jahrbüch.* p. 741. n. 11 (1889) (*p.p.*); Holland, *Proc. Boston Soc. N. H.* XXV. p. 77. n. 125 (1890) (S. Celebes); Röthsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

Ornithoptera (Pompeusptera, Pompeuspterus, Pompeoptera!) *hippolytus*, Rippou, *Icon. Ornith.* text (1889) (*p.p.*).

♂ ♀. *Ornithoptera hippolytus* var. *celebensis* Standinger (*acc. Wallace*, 1865), *Iris* VII. p. 342 (1895) (Celebes).

♂. Scarcely different from *hypolitus*. The whitish nervular stripes on the upperside of the forewings are due to the scaling being scarce and the membrane of the wing shining through; there are only a few white or yellowish scales (which belong to the under layer), while in *hypolitus* the streaks are obviously scaled white. On the hindwings the yellow spots at the extremity of the two upper median veins are much clouded with black; below, the marginal cloud of whitish scales referred to under *sulaensis* is absent or scarcely indicated.

♀. The median cellules to the hindwings are without a yellow tint; the discoidal cell has a white apical spot of variable size on the upperside.

Hab. Celebes (1 ♂, 5 ♀); Talaut (W. Doherty *leg.*, 1 ♂, 1 ♀).

The two Talaut specimens belong to this subspecies. The *male* has rather more white scales at the nervules of the forewings above, the hindwings are somewhat more acutely dentate, and the second abdominal segment has no dorsal orange spot.

Note.—The upperside of the hindwings of the *male* has, as far as the white area of the underside is extended, a peculiar grey appearance, owing to the black scaling being rather dispersed; between the median vein and the abdominal fold the upper and under scales are well developed. The scaling of the upperside of the wings has a dark green metallic gloss; the scales are much less denticulate than in the other yellow species of *Troides*; they are toothless in the marginal and discal regions of the hindwings.—K. J.

10. *Troides darsius* (Gray) [♂, ♀, metam.].

♂. *Ornithoptera amphimedon* Doubleday (*nov* Cramer, 1779), *Gen. Diurn. Lep.* 1. p. 4. n. 6 (*p.p.*), t. 1. f. 2 (♂) (1846) (Ceylon).

♂ ♀. *Papilio darsius* Gray, *Cat. Lep. Ins. B. M.* 1. p. 5. n. 11 (1852) (Ceylon); *id.*, *List Lep. Ins. B. M.* 1. p. 4. n. 13 (1856) (Ceylon); Feld., *Verh. z. b. Ges. Wien* p. 291. n. 24 (1864) (Ceylon).

♂ ♀. *Ornithoptera darsius*, Horsfield & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 87. n. 176. t. 2. f. 2. 2a (larva, pupa) (1857) (Ceylon); Feld., *Wien. Ent. Mon.* IV. p. 97 (1860); Oberth., *Et. d'Ent.* IV. p. 30. n. 8 (1879); Moore, *Lep. Ceylon* 1. p. 155. t. 55. f. 1. 1a. 1b (♂, ♀, *l. p.*) (1881); Fickert, *Zool. Jahrb.* p. 736. n. 6 (1889).

♂. The yellow cellular mark of the hindwings is often reduced to a very small spot; the first discal mark is in some individuals about half the size of that in others; the posterior mark includes sometimes a minute black spot.

♀. Between the costal and subcostal veins of the hindwings there are mostly two small yellow linear spots, which correspond to the discal and submarginal spots of the other cellules; below, the submarginal yellow markings situated between the median veins are often joined to the marginal whitish spots by means of a whitish buff scaling which forms two short, longitudinal, marginal streaks within each median cellule.

Hab. Ceylon (10 ♂, 8 ♀).

11. *Troides minos* (Cramer) [♂, ♀, metam.].

♀. *Papilio Eques Trojanius minos* Cramer, *Pap. Ecot.* III. p. 4. t. 195. f. a (1779) ("W. Sumatra" *loc. err.*); Jablonsky & Herbst, *Naturg. Schmett.* 1. p. 206. n. 7. t. 4. f. 2 (1782); Esper, *Aust. Schmett.* p. 127. n. 56. t. 32. f. 1 (1792).

♀. *Papilio Eques Trojanius astenous* Fabricius, *Spec. Ins.* 11. p. 10. n. 38 (1781) (*p.p.*); Gmelin, *Syst. Nat.* 1. 5. p. 2234. n. 297 (1790); Fabr., *Ent. Syst.* 111. 1. p. 19. n. 58. 1793 (*p.p.*).

♀. *Papilio amphrisius*, Godart, *Enc. Méth.* IX. p. 27. n. 7 (1819) (*p.p.*).

♀. *Ornithoptera helicon*, Boisduval, *Spec. Gén. Léop.* 1. p. 178. n. 7 (1836) (*p.p.*).

- ♀. *Ornithoptera pompeus*, Doubl. Westw. & Hew., *Gen. Doubl. L. p. 1* p. 1. n. 9 (1846) (*sub synonym.*)
Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. 1* p. 87, n. 177 (1857) (*sub synonym.*); Wall., *Tr.
Linn. Soc. Lond. XXV.* p. 39, n. 9 (1865) (*sub synonym.*).
- ♀. *Papilio pompeus*, Gray, *Cat. Lep. Ins. B. M. I.* p. 5, n. 13 (1852) (*sub synonym.*); id., *List Lep. Ins.
B. M. I.* p. 5, n. 15 (1856) (*sub synonym.*).
- ♀. *Papilio minos*, Felder, *Verh. z. b. Ges. Wien* p. 291, n. 33, & p. 334, n. 22 (1864) ("Sumatra"
loc. err.).
- ♂ ♀. *Ornithoptera spec.*, Sealy, *Proc. Ent. Soc. Lond.* p. 9 (1875) (Malabar, Travancore, Cochin; *metam.*).
- (?) ♂ ♀. *Ornithoptera minos*, Oberthür, *Et. d'Ent.* IV. p. 32, n. 14 (1879) ("Burma" *loc. err.*, *vel
spec. alt.?*).
- ♂ ♀. *Ornithoptera pompeus* var. *minos*, Wood-Mason, *Journ. As. Soc. Beng.* p. 86 (1881) (Trevandrum);
Fickert, *Zool. Jahrbüch.* p. 730, n. 1c (1889) ("Burma," "Sumatra," *loc. err.*).
- ♂ ♀. *Ornithoptera minos*, Stauding. & Schatz, *Exot. Schmett.* I. p. 5 (1884) (Malabar); Aitken,
Journ. Bomb. N. H. Soc. p. 35, n. 73 (1887) (Bombay); Davidson & Aitken, *ibid.* p. 361, n. 64
(1890) (*life history*).
- ♂ ♀. *Papilio (Ornithoptera) minos*, Hampson, *Journ. As. Soc. Beng.* p. 363, n. 193 (1888) (Nilgiris,
3000 to 7000 feet); Ferguson, *Journ. Bomb. N. H. Soc.* p. 445, n. 167 (1891) (Travancore; fairly
common, up to 4000 feet).

Cramer's figure, which represents a *female* with the yellow abdomen of a *male*, fits exactly—exclusive of the wrong abdomen—to the only *Troides* found in South India. Many authors—misled by Fabricius, who identified *minos* with his *astenus*, and by the erroneous *habitat* ("West Sumatra") given by Cramer—have treated this insect either as synonymous with or as a variety of *T. helena* (L.) [= *pompeus* (Cram.) = *helicon* (Fabr.) = *astenus* (Fabr.)], and I am astonished to see that also Fickert (*l.c.*) did not perceive the close relationship of *T. minos* (Cram.) to the *darsius-criton-haliphron* group on one side, and to *T. aeacus* (Feld.) and *rhadamantus* (Lucas) on the other side. While in both sexes of *T. helena* (L.), *T. helena cerberus* (Feld.) and the other subspecies of *helena*, the black colour enters the cell of the hindwings from the costal side of the base of the wing, it enters the cell from the abdominal side, or in a straight line from the base, in *T. criton*, *haliphron*, etc.; in *helena* the black colour of the basal portion of the hindwings increases in the direction from the costal margin to the anal angle; in *criton*, *darsius*, etc., especially in the *males*, it increases in the direction from the abdominal margin to the anterior angle, or from the base to the outer margin; in the case of *helena* the cellule between the costal and subcostal veins is the first to become entirely filled up with black, whereas in the *males* of the other group of species the cellule between the submedian nervure and the lower median vein is the first to assume the black colour. In this respect *T. minos* ♂ certainly agrees better with *darsius* and allies than with *helena*. The rather thin sealing of the middle of the disc of the forewings, and the black powdering at the edge of the black marginal border of the hindwings between the median nervules which we find in many specimens, are characters which the *male* of *T. minos* (Cram.) has in common with the *male* of *T. aeacus* (Feld.). That black powdering is very peculiar; in certain specimens of *aeacus* it is rather extended, and in one specimen of the Philippine *rhadamantus* (Lucas), which is the nearest ally of *aeacus*, the median cellules are all overpowdered with black, thus reminding one of *T. rhadamantus plateni* (Stauding.) from Palawan. The *female* of *minos* agrees with *aeacus* in the white border of the cell of the forewings and in the position of the black discal spots of the hindwings.

The hindwings of *minos* ♂ and ♀ are as hairy in the basal and abdominal region as in *darsius*. The subcostal nervure, from the base to the origin of the subcostal nervule, is as long as in *darsius* and allies, *i.e.* longer than in *helena* (L.), especially in the *male*.

♂. The black abdominal border of the hindwings extends often beyond the lower median nervules; sometimes it includes a yellow streak of variable size situated along the median nervure. The whitish adnervular streaks assume sometimes a yellowish colour behind the cell. The yellow abdomen has on each side of the fifth and sixth segments a dorso-lateral black spot, and a dorso-median spot on the eighth segment.

♀. The white border to the cell of the forewings varies from extending down to the base of the wing to being restricted to the apical third of the cell; the white streaks along the median and discoidal nervules are narrow and sharply defined. On the hindwings the first yellow discal mark behind the costal nervure is variable in size. The middle of the underside of each abdominal segment is occupied by one large or two smaller black spots.

Hab. S. India (Malabar, Travancore, Nilgiris, Bombay; 9 ♂, 12 ♀).

12. *Troides vandepolli* (Snellen) [♂, ♀].

♂ ♀. *Papilio vandepolli* Snellen, *Tijdschr. v. Ent.* XXXIII. p. 22 (1890) (Preanger Mts., 5000 to 5500 feet).

Ornithoptera vandepolli, Fruhstorfer, *Berl. Ent. Zeitschr.* XXXIX. p. 241. t. 17. f. 1 (♂, ♀) (1894).

This is a most excellent species, with a broad discoidal cell to the hindwings of both sexes.

(a): *T. vandepolli* (Snellen), forma typ. [♂, ♀].

The underside and the sides of the fourth to eighth abdominal segments are yellow, with two rows of black ventral spots. There are no red pectoral spots underneath the wings.

♂. The yellow cellular spot of the hindwings has always an ovate shape. On the underside of the hindwings there is a marginal, rather ill-defined, yellow mark between the second and third median nervules, which often assumes the form of the letter V; many specimens have a transverse yellow bar before this mark.

♀. The two small yellow markings between the costal and subcostal veins of the hindwings are sometimes connected with one another and form a large lunule, the concave side of which is directed towards the subcostal vein. Below, the posterior marginal buff lunules are mostly joined to the discal creamy or yellowish buff area by means of a buffish sealing forming one or two short longitudinal streaks in the cellules between the median veins.

Hab. Java, at higher elevations (H. Fruhstorfer: Mt. Gede, 4000 feet, August 1892; 8 ♂, 6 ♀).

(b): *T. vandepolli honrathianus* (Martin) [♂, ♀].

♀. *Ornithoptera honrathiana* Martin, *Berl. Ent. Zeit.* XXXVII. p. 492 (1892) (Sumatra).

♂ ♀. *Ornithoptera honrathiana* Martin, *Natuurk. Tijdschr. v. Ned. Ind.* LIII. 3 (Sep.). p. 1. n. 1 (1893); Hagen, *Iris* VII. p. 19. n. 4 (1894) (Sumatra).

Differs from the Javan *vandepolli* especially in the abdomen being almost entirely black.

Hab. Sumatra (Batak country; 1 ♂, 1 ♀; probably also in the mountainous regions of S.W. Sumatra).

This insect seems to me to be only a local form of *T. vandepolli* Snellen, though Martin may be right in treating it as a distinct species; for want of good material we cannot decide the question.

13. *Troides haliphron* (Boisd.) ♂♂, ♀♀, metam.

- ♂. *Ornithoptera haliphron* Boisduval, *Spec. Gén. Léop.* I. p. 181. n. 9 (1836) (Celebes).
 ♂♀. *Ornithoptera haliphron*, Felder, *Wien. Ent. Mon.* IV. p. 98. n. 52. t. 2. f. 2a. 2b (♂, ♀) (1860) (Celebes); Wall, *Tr. Linn. Soc. Lond.* XXV. p. 40. n. 14 (1865) (Macassar); Oberth., *Et. d'Ent.* IV. p. 30. n. 7. & p. 110. n. 7 (1879) (Celebes); Stauding. & Schatz, *Exot. Schmett.* I. p. 5. t. 2 (♂) (1884) (Celebes); Fickert, *Zool. Jahrbüch.* p. 731. n. 4 (1889) (Celebes); Ribbe, *Iris* III. p. 39 (1890) (Celebes; larva & pupa); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).
 ♂. *Ornithoptera amphimedon*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 1. n. 6 (1846) (p.p.); Gray, *Cat. Lep. Ins. B. M.* I. p. 5. n. 12 (1852) (p.p.).
 ♂♀. *Papilio haliphron*, Felder, *Verh. z. b. Ges. Wien* p. 291. n. 25. & p. 334. n. 20 (1861) (Celebes); Piepers & Snellen, *Tijdschr. v. Ent.* XXI. p. 37. n. 147 (1878) (Saleyer, very common; Bantimoerong).
 ♀. *Ornithoptera haliphron* var. *bauermanni* Röber, *Iris* I. p. 19 (♀, new ♂) (1885) (Kabia Island).

Three local forms belong to this species:—

(a): *T. haliphron* (Boisd.) from Celebes and the adjacent small islands;

(b): *T. haliphron natus* (Doherty) from Sumba, Sambawa, Alor, Adonara, and Wetter;

(c): *T. haliphron iris* (Röber) from Letti.

Doherty's *Troides natus* var. *sambawanus* and Röber's *T. haliphron* var. *bauermanni* are mere aberrations.

(a): **T. haliphron** (Boisd.), forma typ. [♂, ♀, metam.].

Breast with red hairs underneath the wings; yellow colour of the underside of the abdomen much restricted, forming narrow transverse bands to the posterior segments.

♂. All the nervules of the forewings are bordered with white below, less so on the upperside; on the underside the discoidal cell has also a white border in the apical two-fifths, and the intercellular folds are whitish at the apex. The yellow area of the hindwings consists of five discal spots, situated between the costal margin and the second median nervule; the spots are nearly of equal length; sometimes, however, the first and last are reduced; behind the second median nervule there is seldom a seventh, minute spot; some individuals have a small spot within the apex of the cell stretching along the discocellular veinlets.

(a): ♂-ab, *bauermanni* (Röber).

♂. *Ornithoptera haliphron* var. *bauermanni* Röber, *Iris* I. p. 19 (♂, new ♀) (1885) (Kabia Island).

The cellular yellow spot of the hindwings before referred to large.

This aberration, which forms a transition to *T. haliphron natus* (Doherty), is not confined to the Island of Kabia, but occurs also on the main island of Celebes.

Röber [*Tijdschr. v. Ent.* XXXIV. p. 270 (1891)] mentions a yellow V-shaped marginal mark, standing on the underside of the hindwings between the lower median nervules, and adds that he cannot find an explanation of this curious marking. If we compare other species, and also the *females*, we find that this mark is not so peculiar, and that it appears also between the upper median nervules. It is composed of the marginal internervular spot, and the rest of the adnervular streaks which in several species run from the yellow discal area towards the outer margin and separate the submarginal black spots from each other [compare the ♀ of *T. oblongomaculatus* (Goetz)]; as the submarginal black spots are entirely merged together with the marginal black spots to form a broad black marginal band in *haliphron*,

eriton, etc., the before-mentioned adnervular yellow or buffish lines have disappeared, but appear again in some specimens, and then stand either isolated or are joined to the marginal buffish spots, and form in the latter case the I-shaped mark.

♀. The white markings of the forewings are much more prominent than in the ♂, especially on the upperside; below there is a geminate streak along the submedian vein, which is absent from the other sex. The yellow area of the hindwings is rather reduced; it consists of a cellular mark that occupies about half of the cell, and of six discal markings, of which the first is very small, and the last, which is much suffused with black, is whitish, not yellow. The discal black markings, four or five in number, are rather narrow and long, and stand nearer to the cell than to the outer margin, the black marginal border being very broad; below there are two or three minute spots between the costal margin and the upper discoidal nervule, which correspond to those portions of the discal yellow area which lie between the discal black margins and the black marginal border.

(b²): ♀-ab. *pullens* (Oberth.).

♀. *Ornithoptera haliphron* aberr. (an var. ?) *pullens* Oberthür, *Et. d'Ent.* IV. p. 110. sub n. 7 (1879) (Celebes).

♀. *Ornithoptera haliphron* var. *bauermanni* Röber, *Iris* I. p. 19 (1885) (♀ *p.p.*; Kabia Island).

Streaks of the forewings whiter than in typical *haliphron*; base of the forewings and body almost fawn-colour.

Hab. Celebes (9 ♂, 4 ♀); Saleyer (1 ♂, 1 ♀); Kabia Island.

(b): **T. haliphron naias** (Doherty) [♂, ♀].

♂ ♀. *Ornithoptera naias* Doherty, *Journ. As. Soc. Beng.* p. 193. n. 116 (1891) (Sumba: common).

♂ ♀. *Ornithoptera naias* var. *sambawana* Doherty, *l.c.* p. 194. sub n. 116 (1891) (Sambawa).

♂ ♀. *Ornithoptera socrates* Staudinger, *Iris* IV. p. 71 (1891) (Wetter; Sambawa); id. *l.c.* VI. p. 83. t. 1. f. 1 (♂) (1893) (Wetter).

Though I have not seen Sumba specimens, I have, judging from Doherty's description of *naias*, no doubt that all the specimens from Sambawa, Alor, Adonara, and Wetter belong to this subspecies. The characters by which Doherty separates *sambawanus* from *naias* are not at all constant in the Sambawa examples, many of the latter belonging to typical *naias*, others to *sambawanus*; the specimens from the other localities are just as variable as, and do not differ from my individuals from Sambawa. As the number and size of the yellow spots of the hindwings is so variable in all the allied insects, I think it advisable to treat the aberration *sambawanus* as a mere synonym, else we shall have to bestow names upon a great number of individual aberrations of *haliphron*, *plato*, *iris*, *eriton*, etc.

♂. The white streaks on the underside of the forewings are narrower than in *haliphron* (Boisd.). The hindwings are much more pointed at the anal angle; the discal yellow area is similar to that of *T. haliphron* ♂-ab. *bauermanni* (Röber), but extends farther towards the base; the first discal spot, between the costal and subcostal veins, is larger; the others become gradually shorter; there are four or five discal spots, the fifth being mostly small or obliterated. The cellular spot extends mostly from the subcostal vein, half-way between the base of the wing and the origin of the subcostal nervule, to the origin of the second discoidal vein; sometimes it is much broader at the apex of the cell, extending as far as the origin of the second median nervule.

♀. The white border of the cell of the forewings longer than in *haliphron*. The discal black spots of the hindwings stand farther from the cell than in *haliphron*; there are five or six yellow markings on the disc, the first standing before the subcostal vein being often obliterated, and a yellowish white, rather large mark beyond the cell; the cellular spot occupies about three-quarters of the cell; the discal black markings are sometimes merged together with the black marginal border; their exterior limits are, however, indicated by some geminate yellow spots situated half-way between the yellow discal area and the outer margin of the wing.

The pectoral red spots underneath the wings are sometimes much reduced in both sexes, especially in the examples from Wetter.

Hab. Sumba; Sambawa (14 ♂, 6 ♀); Adonara (5 ♂, 1 ♀); Alor (2 ♂, 1 ♀); Wetter (3 ♂, 1 ♀).

(c): **T. haliphron iris** (Röber) [♂, ♀].

♂ ♀. *Ornithoptera iris* Röber, *Ent. Nachr.*, p. 369 (1888) (Letti); Stauding., *Iris* IV, p. 74 (1891) (*iris* is probably a local form of *haliphron*); Röber, *Tijdschr. v. Ent.* XXXIV, p. 270 (1891) (Letti; *iris* differentiated from *haliphron*).

This form is usually devoid of the red pectoral hairs, but in one of my ♀ examples from Letti the breast is as red underneath the wings as in *haliphron* and *naias*; the same specimen has also a red collar, while in typical *iris* the collar is of a dirty buff colour. In both sexes the edges of the abdominal segments below are not yellow, but dirty buffish brown. The white streaks of the forewings are less prominent than in *haliphron*.

♂. The discal yellow area of the hindwings is similar to that of *haliphron*. In most specimens there are only four spots present, situated between the subcostal and second median veins; but often there appears a spot beyond the second median nervule, another before the subcostal vein, and also a third within the apex of the cell.

♀. The apical third of the cell of the forewings beneath is almost all white. The discal black spots of the hindwings are entirely merged together with the black marginal band; there are no yellow spots within this black border of the wing, but in two of my specimens they are indicated below. The discal yellow area consists of a rather small cellular spot, which does not reach, or scarcely reaches to the origin of the third median vein, and four discal markings standing between the first discoidal and third median nervules, and varying considerably in length; to these spots comes often a small mark in front of the upper discoidal nervule, and nearly always a paler spot behind the third median vein.

Hab. Letti (W. Doherty, July 1892) (10 ♂, 6 ♀).

14. **Troides standingeri** (Röber) [♂, ♀].

♂ ♀. *Ornithoptera standingeri* Röber, *Ent. Nachr.*, p. 369 (1888) (Loeang I.); Stauding., *Iris* IV, p. 74 (1891) (Babber & Loeang); Röber, *Tijdschr. v. Ent.* XXXIV, p. 268 (1891) (Loeang; Babber; *see* Wetter).

T. standingeri (Röber) and *plato* (Wall.) are very closely allied to *T. criton* (Feld.), and approach on the other hand also *T. haliphron* (Boisd.) and its local races. Though I believe that, when the fauna of all the islands between Java, Celebes, and New Guinea is completely known, all these *Troides* will be connected by a chain of intergraduate specimens, and, therefore, will sink to the rank of subspecies of *T. haliphron* (Boisd.). I must treat *T. standingeri*, *plato*, *criton*, *riedeli*, and *haliphron* as distinct species, because we can at present still draw exact parting lines between

these insects. *T. natus* (Doherty) and *iris* (Röber), however, are not always recognisable without the help of locality, and are only local forms of *T. haliphron* (Boisd.).

Both sexes of *staudingeri* (Röber) have red pectoral spots underneath the wings. The abdomen is coloured as in *riedeli*; the yellow colour of the underside is perhaps a little more extended.

♂. The white, adnervular streaks of the forewings below are longer than in *T. riedeli* (Kirsch); those which border the second median nervule reach the cell. The first discal spot of the hindwings is larger than in *riedeli*, but shorter than in *eriton* (Feld.).

♀. The two specimens before me (one of which is lent to me by Dr. Staudinger) vary somewhat in the amount of white on the forewings and in the size of the yellow markings to the hindwings; there are no yellow submarginal spots within the broad black border of the hindwings.

Hab. Loeang; Babber (W. Doherty, July 1892) (1 ♂, 1 ♀).

15. *Troides plato* (Wall.) [♂, ♀].

♂. *Ornithoptera plato* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 40. n. 13 (1865) (Timor): Stauding., *Iris* IV. p. 74 (1891) [Timor; *plato* is a slight local form of *eriton* (Feld.)].

♂ ♀. *Ornithoptera plato*, Röber, *Tijdschr. v. Ent.* XXXIV. p. 269 (1891) (Timor).

Both sexes are devoid of the red pectoral hairs underneath the wings; but in one of my *females* there stand some red hairs at the side of the metasternum. Wallace (*l.c.*) says that *plato* has no red collar. This is a mistake; most probably the head of Wallace's specimen was bent backwards, as in consequence of such a position of the head the red collar is concealed by the black hairs of the neck. The black basal two-fifths of the wings are sharply limited in a regularly arched curve.

♂. The adnervular white streaks of the underside of the forewings are very broad, broader than in any allied species, but not of constant size. The sealing of the upperside is less dense between the discoidal and median nervules, so that this part of the wing has a peculiar appearance, being semi-transparent. The size of the yellow cellular spot of the hindwings is rather variable; in some specimens that spot reaches along the median vein as far as the origin of the lower median nervule, while in others it reaches scarcely beyond the second median vein. The posterior spot (the sixth) of the discal series is also inconstant in length and breadth.

♀. The forewings vary much in the amount of white: the apical fourth or third of the cell, and the bases of the cellules at the extremity of the cell, are above feebly suffused with white; or these parts and geminate streaks at the submedian and lower median veins are conspicuously white, so that there is a discal white patch extended between costal and inner margins, inwardly concave and sharply limited, exteriorly gradually shading off and extending along the veins. In a specimen in Dr. Staudinger's collection the apical two-fifths of the cell are white, exclusive of two broad and a narrow longitudinal streak, and the white region outside the cell is much reduced in consequence of the black internervular streaks being long and very prominent; the black streaks between the two lower median nervules and between the lower median and submedian veins are especially dark, and join the black basal region without assuming a paler colour; hence the black basal region is much less regularly convex than in other *females* and the *male*.

The subdiscal black spots of the hindwings are in one form of the *female* well marked, the four posterior ones being partly or entirely surrounded with yellow; in

a second form the spots are merged together with the black outer margin, and their exterior limits are indicated by minute, adnervular, yellow spots. The yellow patch of the hindwings is sometimes much paler below than above; it consists of six to seven discal and a cellular spot; the latter is in Dr. Staudinger's specimen twice the size of that in one of my own individuals, reaching in the former beyond the origin of the subcostal nervule; the first discal spot, standing in front of the subcostal vein, is small and often absent.

The hindwings are rather strongly indented in both sexes. The marginal spots of the *female* are large. The abdomen is similar in pattern to that of *T. riedeli* (Kirsch).

Hab. Timor (W. Doherty: Oinainisa, Dutch Timor, November to December 1891) (6 ♂, 3 ♀).

16. *Troides criton* (Feld.) [♂, ♀, metam.].

♂ ♀. *Ornithoptera criton* Felder, *Wien Ent. Mon.* IV, p. 225, n. 72 (1860) (Batjan); Wall, *Tr. Linn. Soc. Lond.* XXV, p. 40, n. 12 (1865) (Batjan; Ternate; Gilolo; Morty); Oberth., *Et. d'Ent.* IV, p. 31, n. 10 (1879) (Dodinga; Ternate); id., *Ann. Mus. Civ. Genova* XV, p. 468, n. 3 (1880) (Ternate; Halmahera); Bntl., *Ann. Mag. N. II.* (5), X111, p. 196, n. 42 (1884) (Ternate); Standing. & Schatz, *Esot. Schwedt.* I, p. 5 (1884); Fickert, *Zool. Jahrbüch.* p. 737, n. 7, t. 21, f. 7 (♂) (1889); Ribbe, *Iris* III, p. 43 (1891) (Batjan; larva & pupa).

♂ ♀. *Papilio criton* Felder, *l.c.* p. 291, n. 23 (1864) (Batjan; Halmahera); id., *Reise Novara, Lep.* I, p. 12, n. 6, t. 4, f. a—c (♂, ♀) (1865).

♂. The yellow spot of the cell to the hindwings is longest anteriorly, being limited basally in the direction of the lower median nervule; in *T. oblongomaculatus* (Goeze) the spot is cut off in the direction of the subcostal nervule; the first, postcostal mark of the hindwings is mostly the largest of all the discal spots; there is no yellow mark behind the lower median nervule.

♀. The yellow spot in the cell of the hindwings is mostly small, and basally cut off either transversely or in the direction of the lower median nervule; behind the lower median nervule there is either no spot, or a very small one; the subdiscal black spots are small and joined to the black border of the wings, but are apparently never completely merged together with the marginal band, as is so often the case in *T. oblongomaculatus papuensis* (Wall.). The underside of the abdomen is black, with the hinder edges of the segments yellow; the yellow edge of the eighth segment is broad and dilated in the middle.

There are three different forms of the *female*:—

(a²): Typical *female*: similar to the *male*, *i.e.* forewings black above and below; disc of the hindwings of the same yellow colour on both sides as in the other sex.

(b²): ♀-ab. *oberthürri* ab. nov.

Forewings with a white patch occupying the extremity of the cell and extending along the subcostal, discoidal, and upper median nervules, as in *T. oblongomaculatus papuensis* ♀-ab. *papuensis* Oberthür; yellow region of the hindwings buffish below. Resembles the *female* of *T. riedeli* (Kirsch).

(c²): ♀-ab. *felderi* ab. nov.

Papilio criton ♀ Felder, *Reise Novara, Lep.* I, t. 4, f. b, c. (1865).

Smaller than the other *females*. Yellow region of the hindwings of the same buffish colour as in the ♀ of *T. oblongomaculatus* (Goeze). Marginal fringe of both wings unicolorous buff, not black at the nervules.

All three *females* occur together, and are connected by intergraduate specimens; the two forms which I have named here are of interest, as their characters point to other species of *Troides*.

Hab. Northern Moluccas: Batjan (8 ♂, 4 ♀); Ternate (2 ♂); Halmahera (3 ♂, 3 ♀); Morty.

17. *Troides riedeli* (Kirsch) [♂, ♀].

♂ ♀. *Ornithoptera riedeli* Kirsch, *P. Z. S.* p. 275. n. 1. t. 19. f. 1 (♂). 2 (♀) (1885) (Timor Laut); Röber, *Tijdschr. v. Ent.* XXXIV. p. 269 (1891) (Timor Laut); Smith & Kirby, *Throp. Exot.* II. *Orn.* p. 3. t. 2. f. 1 (♂). 2 (♀) (1892).

A very constant species. The breast is covered underneath the wings with red hairs.

♂. The forewings have sometimes feeble, adnervular, whitish streaks above; below, these streaks are much more prominent. The yellow spot in the cell of the hindwings varies a little in size. The discal spots gradually increase in length from the second to the sixth spot; the first is always much smaller than the second, being often hardly a third of the size of the latter. The abdomen is black, with the hinder edges of the third to eighth segments below yellow; this yellow edge is dilated in the middle of the fifth to seventh segments.

♀. Only one form is known, the forewings of which have a white patch at the extremity of the cell, as in *T. criton* ♀-ab. *oberthüri* mihi and in *T. oblongomaculatus papuensis* ♀-ab. *papuensis* (Oberth.). The hindwings have often a small yellow spot in the end of the cell; there are mostly four yellow discal markings between the upper discoidal and the third median nervules; they are connected along the veins with the yellow submarginal spots, and thus the subdiscal black markings are surrounded with yellow, or partly so; behind the lower median nervule there stands a rather small buffish spot of variable size, and in some specimens there is also a minute yellow spot in front of the upper discoidal nervule. The abdomen is similar to that of the ♂, but the seventh segment has a yellow middle line.

Hab. Tenimber Islands (W. Doherty, June to July 1892) (5 ♂, 5 ♀).

18. *Troides oblongomaculatus* (Goeze) [♂, ♀, metam.].

Seba, *Thes.* IV. p. 22. t. 16. f. 6. 7 (♀; ex Colonia Surinamensi!) & p. 55. t. 45. f. 9-12 (♂) (Amboina) (1765).

♂. *Papilio Eques Trojanus heleana*, Clerck (*nec* Linné, 1758), *Acon. Ins.* II. t. 22. f. 1 (1764); Linné, *Mus. Lud. Utr.* p. 139. n. 18 (1764) (*Hab.* in "America meridionali," *ex err.*); Houtt., *Naturl. Hist.* I. 11. p. 20. n. 18 (1767) (*p.p.*); Linné, *Syst. Nat.* ed. xii. p. 748. n. 19 (1767) (*p.p.*); Müller, *Naturs.* V. 1. p. 571. n. 19 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 449. n. 28 (1775) (*p.p.*); Cramer, *Pap. Ex.* II. p. 66. t. 140. f. a. v (♂) (1777) (Amboina); Goeze, *Ent. Beytr.* III. 1. p. 38. n. 19 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 10. n. 39 (1781) (*p.p.*); Jablonsky, *Naturs. Schmetz.* I. p. 203. n. 5. t. 3. f. 2 (♂) (1783); Esper, *Aust. Schmetz.* p. 43. t. 9. f. 2 (1786) (♂, *erroneously rec. as* ♀); Fabr., *Mant. Ins.* II. p. 5. n. 42 (1787) (*p.p.*); Gmelin, *Syst. Nat.* I. 5. p. 2234. n. 19 (1790); Fabr., *Ent. Syst.* III. 1. p. 19. n. 59 (1793) (*p.p.*).

♀. *Papilio Eques Trojanus oblongomaculatus* Goeze, *Ent. Beytr.* III. 1. p. 41. n. 22 (1779) (*typus*; *Schae* fig. 6. 7. *tabulae* 16).

♀. *Papilio Eques Trojanus amphimedon* Cramer, *Pap. Exot.* III. p. 2. t. 194. f. a (1779) (Amboina); Fabr., *Spec. Ins.* II. p. 8. n. 31 (1781); Jablonsky, *Naturs. Schmetz.* I. p. 201. n. 6. t. 4. f. 1 (1784) (Amboina); Fabr., *Mant. Ins.* II. p. 5. n. 31 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2231. n. 291 (1790) (Amboina); Esper, *Aust. Schmetz.* p. 75. n. 33. t. 18. f. 1 (1790) ("♂" *ex err.*); Fabr., *Ent. Syst.* III. 1. p. 15. n. 45 (1793) (Amboina); Esper, *l.c.* p. 250. t. 40. c. f. 2 (1796?).

♀. *Troides amphimedon*, Hubner, *Verz. bck. Schm.* p. 88. n. 920 (1816).

♂. *Troides heleana*, Hübner, *l.c.* p. 88. n. 921 (1816) (*p.p.*).

- ♀. *Papilio amphimedon*, Godart, *Enc. Méth.* IX. p. 26. n. 4 (1819); Gray, *Cat. Lep. Ins. B. M. I.* p. 5. n. 12 (1852) (Amboina; nec Celebes); id., *List Lep. Ins. B. M. I.* p. 4. n. 11 (1856) (Ceram).
- ♂. *Papilio helen*, Godart, *l.c.* p. 27. n. 6 (1819).
- ♀. *Ornithoptera amphimedon*, Boisduval, *Voy. Astrolabe*, *Lép.* p. 35. n. 2. t. 1. f. 1. 2 (1832) (Amboina; nec Celebes); id., *Spec. Gén. Lép.* I. p. 176. n. 4 (1836) (Amboina; nec Celebes); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 6, (nec tab.) (1846) (Amboina; nec Celebes, nec Ceylon).
- ♂. *Ornithoptera helena*, Boisduval, *Voy. Astrolabe*, *Lép.* p. 36. n. 3 (1832) (Amboina; nec Buru, nec Rawak); id., *Spec. Gén. Lép.* I. p. 177. n. 5 (1836) (Amboina; *helena* L = ♂ of *amphimedon* Cram. ?); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 7 (1846) (Amboina; Vollenbov., *Tijdschr. v. Ent.* III. p. 71. n. 5 (1860) (p.p.).
- ♂. *Papilio helena*, Gray, *Cat. Lep. Ins. B. M. I.* p. 5. n. 10 (1852); id., *List Lep. Ins. B. M. I.* p. 4. n. 12 (1856) (Amboina); Aurivill., *Köngl. Sr. Vet. Ak. Handl.* XIX. 5. p. 22. n. 18 (1882).
- ♂ ♀. *Ornithoptera helena*, Wallace, *Proc. Ent. Soc. Lond.* V. p. 23 (1858) (*O. amphimedon* Cram. = ♀ of *O. helena* L.); Feldl., *Wien. Ent. Mon.* IV. p. 97. sub n. 51 (1860) (*O. amphimedon* Cram. = ♀ of *O. helena* L.); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 38. n. 7 (1865) (Amboina; Ceram); Oberth., *Et. d'Ent.* IV. p. 30. n. 6 (1879) (Amboina; Ceram); Pagenstech., *Jahrb. Nat. Ver. Nass.* p. 55 (1884) (Amboina); Fickert, *Zool. Jahrbüch.* p. 735. n. 5 (1889) (p.p.); Ribbe, *Iris* II. p. 297. n. 3 (1890) (Ceram; ab. of ♀); id., *l.c.* III. p. 41 (1890) (Ceram; larva & pupa); Röber, *Tijdschr. v. Ent.* XXXIV. p. 268 (1891) (Ceram).
- ♂ ♀. *Papilio helena*, Felder, *Verh. z. b. Ges. Wien* p. 291. n. 22 (1861) (Amboina; nec Ternate); Butler, *Cat. Diurn. Lep. descr. Fabric.* p. 234. n. 3 (1869).
- ♂ ♀. *Ornithoptera helena*, Standing. & Schatz, *Exot. Schmett.* I. p. 5. (1888) (Amboina; Ceram).

Linné described the *Papilio Eques Aelivus helena* in *Syst. Nat.* ed. x. p. 461. n. 18 (1758) thus:—

Alis dentatis atris concoloribus: posticis disco communi aurato.

Mer. surin. in tabula titulo præfixa, figura maxima.

Habitat in floribus Arceae Americæ.

Speciosissimus colore fulgentissimi auri, utrinque in disco alarum posticarum.

We observe that Linné enumerates here *helena* under the "*Equites Aelivi*," which have no red spots at the breast underneath the wings; all the yellow *Troides*, except *amphrysus*, *plato*, and allies, have, however, the red pectoral spots, and belong, therefore, to the "*Equites Trojani*." The *helena* of 1764, described in *Mus. Lud. Ur.*, stands indeed under the "*Equites Trojani*." We see, further, that the initials M. L. U., which always stand behind the diagnosis of those species which Linné had seen in the Museum of the Queen Ludovica Ulrica, are left out. We see, thirdly, that Linné refers to Merian's *Insects of Surinam*; I have compared ALL the editions of that work, and find that in the editions of 1705 and 1717 there are no *Troides* figured, but that only on plate 72 of the later editions there is a figure ("*figura maxima*") which represents unmistakably that species of *Troides* which is generally known as *pompeus* (Cramer). This plate 72 does not, however, stand before the title-page ("*titulo præfixa*"), but is the last plate of the work; most probably in the specimen of Merian's book which Linné had before him the last plate, which gives figures of African and Indian animals and has really nothing to do with the remaining text and plates dealing with animals from Surinam, was bound at the beginning of the book.

If we compare further Linné's sentence, "*Habitat in floribus Arceae Americæ*," with the text of Merian, "*Arborem AREKAM . . . non animus est describere; . . . solum hoc loco eam exhibui, ad Erucas et Papiliones, qui super illamveniunt et gignuntur, demonstrandos. Magna illa Eruca alimentum ex FLORIBUS petit, . . . in Aureliam mutatur, unde post aliquot dies pulcherrimus Papilio, formosis nigrisque alis supernis, infernis vero aureo coloris, erumpit,*" it is quite clear—

(1) That Linné, when describing his *helena* in 1758, had no specimen before him, else he would not have put that species amongst the *Equites Achivi*;

(2) That Linné described his *helena* in 1758 from Merian's figure only, which is Cramer's *pompeus*;

(3) That Linné found in 1764 the Amboina insect in the Museum of the Queen Ludovica Ulrica, and mistook it for the insect figured by Merian and named *helena* in 1758.

I am very sorry to state that, in consequence of what I have explained here, the name of *helena* (L.) must be applied to the insect described by Cramer as (*P. E. T.*) *pompeus*, and that for the Moluccan insect the name which comes next in priority must stand. Now the *female* of the Moluccan Papilionid in question received the name of *oblongomaculatus* Goeze in 1779; Cramer published the same sex under the name of *amphimedon*, most probably also in the year 1779. Which name has the priority? The "Vorrede" of Goeze's *Ent. Beytr.* III. 1 is dated "Vor der Michaelismesse 1779," and has been written after the volume was printed (cf. "Vorrede"); Goeze's book came, therefore, out at the "Michaelismesse"—i.e. in the middle of the year 1779. Cramer's Vol. III. is dated 1782; the first plates of Vol. III. have, however, been quoted by Goeze in 1780 and by Fabricius in 1781, so that undoubtedly a number of Cramer's plates of Vol. III. must have been published at least before the "Michaelismesse" of 1780. I cannot find any reference to the exact appearance of Cramer's plates of Vol. III., and as I think it only just that in all cases of doubtful priority the name of that author must have the priority who dated his publication, I am forced to enumerate the insect in question under Goeze's name of *oblongomaculatus*.

This species occurs in the Southern Moluccas, Celebes, and New Guinea, and must be divided into four subspecies:—

(a) : *T. oblongomaculatus* (Goeze) from Amboina, Ceram, Banda Islands :

(b) : *T. oblongomaculatus bouruensis* (Wall.) from the Island of Buru ;

(c) : *T. oblongomaculatus celebensis* (Wall.) from Celebes and Saleyer ;

(d) : *T. oblongomaculatus papuensis* (Wall.) from New Guinea.

In the Northern Moluccas there occurs another species [*T. criton* (Feld.)], while on the Key and Aru Islands no yellow *Troides* has hitherto been found.

(a) : **T. oblongomaculatus** (Goeze), forma typ. [♂, ♀, metam.].

♂. The median and discoidal nervules on the underside of the forewings are mostly bordered with a white scaling, which is, however, seldom very obvious, and sometimes entirely absent. The first spot of the yellow area of the hindwings, situated between the costal and subcostal nervules, is in some individuals four times as large as in others; sometimes the black colour of the base is extended along the subcostal nervure as far as the origin of the subcostal nervule; in other examples the submedian nervure and upper discoidal nervule are broadly, but quite irregularly, black; there is occasionally a black irregular spot in the apex of the cell, and also sometimes some minute patches in the yellow discal area outside the cell. The yellow marking between the median and submedian nervures is narrow, but mostly of about the same length (15 mm.) as the preceding mark; in one of my specimens it is, however, reduced to two minute spots.

♀. The whitish adnervular streaks of the forewings above are often very feebly marked; in other individuals the whitish colour is so much extended as to occupy the outer two-thirds of the wing, exclusive of the costal and outer margins and the

brown internervular streaks, which reach from the outer margin about half-way to the cell. The buffish markings of the upperside of the hindwings are rather small; that within the cell is mostly reduced to a small patch standing posteriorly in the apex of the cell between the origin of the lower median and lower discoidal nervules, and seldom occupies more than the apical third of the cell; in none of my specimens it touches the upper discocellular nervule; the discal spot between the upper discoidal and the subcostal veins is very small or absent; the spot beyond the lower median nervule is very inconstant in size and form; on the underside it is always large, extending from the cell to the outer margin, and includes a submarginal and a subdiscal black patch.

Hab. Amboina (W. Doherty, February 1892) (5 ♂, 7 ♀); Saparua; Ceram (6 ♂, 5 ♀); Banda Islands (W. Doherty) (1 ♂).

The Banda specimen does not differ from Amboina and Ceram examples. Felder records *oblongomaculatus* from Ternate; a ♂ and ♀ in the Felder collection with the locality "Ternate" belong certainly to this species, but the locality is undoubtedly erroneous, as the present species is replaced on the Northern Moluccas by *T. criton* (Feld.).

(b) : ***T. oblongomaculatus bouruensis*** (Wall.) [♂, ♀].

♂. *Ornithoptera helena*, Boisduval (nec Linné, 1758), *Voy. Astrolabe, Lép.* p. 36, n. 3 (1832) (Buru; nec Amboina, nec Rawak).

♂ ♀. *Ornithoptera helena* local form *bouruensis* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 38, sub n. 7 (1865) (Burn).

♂. Scarcely different from the typical form; the yellow region of the hindwings is often more reduced in extent than in *oblongomaculatus*.

♀. Markings of the hindwings much more yellow than in the typical race, especially on the upperside. Size the same as *oblongomaculatus*.

Hab. Burn (W. Doherty) (1 ♀).

(c) : ***T. oblongomaculatus celebensis*** (Wall.) [♂, ♀].

♀. *Ornithoptera amphimedon*, Boisduval (nec Cramer, 1779), *Voy. Astrolabe, Lép.* p. 35, n. 2 (1832) (Celebes; nec Amboina); id., *Spec. Gén. Lép.* I. p. 176, n. 4 (1836) (p.p.); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4, n. 6 (1846) (p.p.).

♂. *Papilio amphimedon*, Gray, *Cat. Lep. Ins. B. M.* I. p. 5, n. 12 (1852) (p.p.).

♂. *Ornithoptera helena* local form *celebensis* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 39, sub n. 7 (1865) (Macassar).

♂ ♀. *Ornithoptera helena* var. *leda* Staudinger (nec Wallace, 1865), *Iris* IV. p. 74 (1891) (Saleyer).

♂. Forewings below with adrenular whitish streaks, which sometimes reach the cell and are connected in pairs at the base. The yellow area of the hindwings more reduced than in *oblongomaculatus*, the spot beyond the lower median nervule wanting; the nervules traversing the yellow area heavily bordered with black.

♀. Markings of the hindwings yellower above and below than in the typical race, smaller, exclusive of that within the cell, which is larger, occupying the apical half or more of the cell; submarginal spots especially much reduced, often absent.

Hab. Macassar and Saleyer (2 ♂, 2 ♀).

(d) : ***T. oblongomaculatus papuensis*** (Wall.) [♂, ♀].

♂. *Ornithoptera helena*, Boisduval (nec Linné, 1758), *Voy. Astrolabe, Lép.* p. 36, n. 3 (1832) (Rawak; nec Amboina, nec Butu).

(?) ♂ ♀. *Ornithoptera helena*, Vollenhoven, *Tijdschr. v. Ent.* III. p. 71, n. 5 (1860) (p.p.).

- (?). ♂. *Ornithoptera amphimedon*, Vollenhoven (*nov. Cramer*, 1779), *l.c.* p. 71, n. 6 (1869) (New Guinea).
- ♀. *Ornithoptera helena* local form *papuanensis* Wallace, *Tr. Linn. Soc. Lond.* XXV, p. 38, sub n. 7 (1865) (New Guinea; Salwatty).
- ♂ ♀. *Ornithoptera helena*, Fiebert, *Zool. Jahrbüch.*, p. 735, n. 5 (1889) (*p.p.*).
- ♂. *Pompeoptera melpomona* Rippon, *Icon. Ornith.* pl. D. f. 9, a-b (1892) (neurulation).
- ♂ ♀. *Ornithoptera (Pompeoptera) papuanensis*, Rippon, *l.c.* text & plate (1893).
- ♂. *Ornithoptera (Pompeoptera) melpomona*, Rippon, *l.c.* text & plate (1893) (New Guinea).

♂. Forewings uniformly black above and below, darker than in *oblongomaculatus* (Goeze). Cellular yellow spot of the hindwings usually larger than in the typical race, more obliquely cut off basally. Yellow spot before the subcostal vein absent or very small; that behind the cell longer than in *oblongomaculatus*.

The black colour of the costal and basal portion of the hindwings penetrates often only a little into the cell. Mostly the black colour of the cell is limited obliquely, the bordering line having the direction of the subcostal nervule; sometimes, however, only the apical half of the cell is yellow. The yellow mark between the abdominal fold and the cell extends mostly to the base of the wing.

♀. The yellow area of the hindwings is of almost as deep a yellow colour as in the *male*. The subdiscal black spots of the hindwings are small, and in many individuals completely merged together with the marginal black border; cellular yellow spot more obliquely cut off basally than in *oblongomaculatus*; postcellular yellow mark shaped as in the *male*, but longer and broader. Abdomen yellow below, with a series of black spots on each side; in *oblongomaculatus* ♀ the underside of the abdomen is black, with the edges of the segments and the middle of the posterior ones yellow.

The forewings are either black above and below, as in the *male*, or there appear whitish streaks along the nervules, first on the underside, then also above. The yellow area of the hindwings is seldom of the same yellow colour on both sides of the wings: in most specimens it has on the underside the pale buffish tint as in *oblongomaculatus*, especially so in the individuals with paler forewings.

(*u*²): ♀-ab. *papuanus* (Oberth.).

Ornithoptera criton var. (ou aberr.?) *papua* Oberthür, *Et. d'Ent.* IV, p. 31, sub n. 10 (1879) (Amberbaki).

Pompeoptera melpomona Rippon, *Icon. Ornith.* pl. D. f. 10 (1892).

Ornithoptera (Pompeoptera) melpomona Rippon, *l.c.* text & plate (1893) (New Guinea).

Mr. Oberthür kindly gave us a sketch of his *papuanus*, and I must state that *papuanus* belongs to *papuanensis* (Wall.), not to *criton* (Feld.).

The adnervular whitish streaks of the forewings in the region of the end of the cell are large and united in pairs at their bases; apical third of the cell also white. Hindwings with small, subdiscal, black spots, which are joined to the black border or stand separate, or with a simple, very broad, black border to the outer margin.

This form of the *female* is connected with the black form by every intergradation. In all the yellow *Troides (Amphisivius)* Swainson there occur two forms of the *female* sex, one with darker, the other with lighter forewings.

Hab. New Guinea (11 ♂, 14 ♀).

Occurs all over New Guinea (I have examples from Redscar Bay, British New Guinea), but is apparently locally rather scarce.

19. *Troides helena* (L.) [*♂, ♀, metam.*].

- ♂. Merian, *Ins. Surinam*. t. 72. fig. max. (1719).
 ♀. *Papilio Eques Achivus helena* Linné, *Syst. Nat.* ed. x. p. 461. n. 18 (1758) (*types: fig. Merianae*).
 ♀. *Papilio Eques Trojannus helena* Linné, *Mus. Lud. Vr.* p. 199. n. 18 (1764) (*sub synonym.*); Houtt., *Nat. Hist.* 1. 11. p. 20. n. 18 (1767) (*p.p.*); Linné, *Syst. Nat.* ed. xii. p. 748. n. 19 (1767) (*p.p.*); Muller, *Naturs.* V. 1. p. 571. n. 19 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 419. n. 28 (1775) (*p.p.*); Goeze, *Ent. Beytr.* III. 1. p. 38. n. 19 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 10. n. 39 (1781) (*p.p.*); Fabr., *Mat. Ins.* II. p. 5. n. 42 (1787) (*p.p.*); id., *Ent. Syst.* III. 1. p. 19. n. 59 (1793) (*p.p.*).
 ♀. *Papilio Eques Achivus pompeus* Cramer, *Pap. Ecot.* I. p. 39 t. 25. f. A (1775) (Batavia); Goeze, *Ent. Beytr.* III. 1. p. 83. n. 52 (1779); Esper, *Aust. Schneitt.* p. 101. n. 43. t. 24. f. 2 (1792).
 ♀. *Papilio Eques Trojannus astenous* Fabricius, *Syst. Ent.* p. 448. n. 270 (1775) (*type in Mus. Banks, still preserved in Brit. Mus.*; hab. in "cap. b. sp." *ex err.*); Goeze, *Ent. Beytr.* III. 1. p. 41. n. 10 (1779); Fabr., *Spec. Ins.* II. p. 10. n. 38 (1781); Jablonsky, *Naturs. Schneitt.* I. p. 201. n. 4. t. 2. f. 3 (1784); Gmelin, *Syst. Nat.* I. 5. p. 2234. n. 297 (1790) (*synon. ex parte*).
 ♂. *Papilio Eques Trojannus heliacon* Fabricius, *Ent. Syst.* III. 1. p. 19. n. 60 (1793) (Ind. or.; *type in Mus. Banks, still preserved in Brit. Mus.*).
 ♂. *Papilio heliacon*, Donovan, *Ins. of India* t. 19 (1800).
 ♂. *Troides helena*, Hübner, *Verz. bek. Schm.* p. 88. n. 921 (1816) (*p.p.*).
 ♀. *Troides astenous*, Hübner, *l.c.* p. 88. n. 922 (1816).
 ♂ ♀. *Papilio amphrisius*, Godart, *Enc. Méth.* IX. p. 27. n. 7 (1819) (*p.p.*); Horsf., *Cat. Lep. Ins. Mus. E. I. C. I.* t. 4. f. 13. a-c (*l. p., anatom.*) (1828); Zinken, *Noeu. Act. Ac. Nat. Cur.* XV. p. 153. n. 8 (1832) (Java; *synon. ex parte*).
 ♂ ♀. *Amphrisius nymphalides* Swainson, *Zool. Illustr.* (2). 11. t. 98 (*♂, l., p.*) (1833) (Java).
 ♂ ♀. *Ornithoptera heliacon*, Boisduval, *Spec. Gén. Léop.* I. p. 178. n. 7 (1836) (Java, *see Sumatra: syn. ex parte*); Blanch., *Hist. Nat. Ins.* III. p. 421. t. 1 [*♂ = hephaestus* (Feld) ?]. 2 (l.). 3 (p.) (1840) (Java); Oberth., *Et. d'Ent.* IV. p. 32. n. 13 (1879) (Java).
 ♂ ♀. *Ornithoptera pompeius*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 9 (1846) (Java; *synon. ex parte*).
 ♂ ♀. *Papilio pompeus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 5. n. 13 (1852) (*p.p.*); id., *List Lep. Ins. B. M.* I. p. 5. n. 15 (1856) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 291. n. 28 (1864) (*p.p.*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 235. n. 4 (1869) (*p.p.*).
 ♂ ♀. *Ornithoptera pompeus*, Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 87. n. 177 (1857) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 71. n. 7 (1860) (Java; Padang; "New Guinea" *err. loc.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 39. n. 9 (1865) (*p.p.*); Stauding. & Schatz, *Ecot. Schneitt.* I. p. 5 (1884); Fickert, *Zool. Jahrbüch.* p. 727. t. 21. f. 5 (*♂*). 6 (*♀*) (1889).

For reasons why this species is the true *helena* (L.) see *T. oblongomaculatus* (Goeze) (page 212).

Fabricius's *astenous* is, according to the specimen in the Banksian collection, based on a typical female of *helena* (L.). The male in the Banksian collection bears a label "*Papilio an helena?*" and comes indeed very near to Merian's figure, upon which Linné's *helena* is based. Donovan's figure of *Papilio heliacon* Fabr. was taken from "an insect from the East Indies, in the cabinet of Sir Joseph Banks, Bart.," and agrees perfectly with the before-mentioned male. As Fabricius described *heliacon* from the Banksian collection, I must take that male for the type of Fabricius's species. This specimen belongs, however, to the Javan race of *helena*, so that *heliacon* (Fabr.), as well as *astenous* (Fabr.), sink as synonyms of *helena* (L.).

Troides helena (L.) ranges from N. India to Sambawa and Celebes, and has developed into five subspecies:—

- (a) *T. helena* (L.) from Java and S.E. Sumatra;
 (b) *T. helena nereis* (Doherty) from Engano;
 (c) *T. helena propinquus* n. from Sambawa;
 (d) *T. helena cerberus* (Feld.) from N. India; Malay Peninsula; Andaman Islands; Sumatra; Nias; Natuna Islands; Borneo; Banguey;

(c): *T. helena hephaestus* (Feld.) from Celebes and Saleyer.

This species can be expected to be found farther east than Sambawa, and may also occur in the Southern Philippines, Sulu Islands, Tonkin, and S. China. I have seen specimens said to be from one and the other of these localities which did not exhibit any differences from the Javan *helena*, and I must therefore conclude that the habitat of those individuals was incorrect.

(a): **T. helena** (L.), forma typ. [♂, ♀, metam.].

♂. The forewings vary above from being uniformly black to being marked with broad, whitish, adnervular streaks; these streaks reach often from the cell to near the outer margin, and are situated at all the nervules; those at the lower median vein are the shortest and do not reach the cell. Below, the forewings vary in a similar way to above, but they are apparently never entirely devoid of white scales, though these scales are often only a few in number. The apex of the cell is sometimes whitish, especially below.

In most individuals the cellule between the costal and subcostal nervules is all black; in some examples there appears a small submarginal yellow spot, and in others a second, discal, linear mark, which is seldom joined to the submarginal spot. The number of the subdiscal black spots varies from 5 to 0; the first and last are the largest; the first is often much enlarged. The spots disappear as follows: first 2, 3, 4; then 1; last 5.

The abdomen has mostly a buffish mark above on the middle of the third, fourth, and fifth segments.

♀. Above, the forewings are brownish black, with very faint whitish adnervular streaks; the apex of the cell a very little paler than the rest of the cell. From this extreme form, the forewings vary to having the outer half (including the apical third or fourth of the cell) nearly all white, suffused with black scales. Below, the white streaks are always present, and vary in length and breadth enormously.

The basal-costal black region of the hindwings extends in nearly all specimens beyond the origin of the subcostal nervule; sometimes it reaches as far as the second discocellular veinlet. Between the costal and subcostal veins there is seldom a yellow submarginal spot. The posterior yellow discal spot reaches often the base of the wing. The subdiscal black markings are exceedingly variable in size; mostly they are joined to the black border of the wing, but stand often isolated; they are liable to obliteration, though they disappear less often than in the *male*. In Oberthür's *T. jupiter* all these spots are absent. I have a specimen in which the second, third, and fourth spots are obsolete above.

The abdomen is yellow below and at the sides; each segment bears two black spots on the underside; the spots of the first and second are mostly merged together to one large mark.

(a²): ab. *jupiter* (Oberth.).

♀. *Ornithoptera jupiter* Oberthür, *Et. d'Ent.* IV. p. 31. n. 11. t. 1. f. 1 (1879) (Java); Fickert, *Zool. Jahrbüch.* p. 741. n. 10 (1889).

Hindwings devoid of subdiscal black spots.

(b²): ab. *pluto* (Feld.).

♀ *Ornithoptera heliocon* var., Boisduval, *Spec. Gén. Léop.* I. p. 179. sub n. 7 (1836) (Java).

♀. *Papilio pluto* Felder, *Verh. z. b. Ges. Wien* p. 291. n. 30 (1860) ("patria?" : nom. nud.) ; id., *Reise Novara, Lep.* I. p. 18. n. 9. 1865. ("patria?").

- ♂ ♀. *Ornithoptera heliacum* ab. *rutilans* Obertür, *Et. d'Ent.* IV. p. 32. sub n. 13 (1879) (Java).
 ♀. *Ornithoptera pompeus* var. *pluto*, Fickert, *Zool. Jahrbüch.* p. 730. n. 1b (1889).
 ♂. *Ornithoptera pompeus* var. *holzi* Pagenstecher, *Jahrb. Nass. Ver. Nat.* 103. n. 3 (1890) (E. Java) :
 id., *l.c.* p. 29 (1894) (*holzi* Pagenstech. = *rutilans* Oberth.).

Hindwings reddish yellow instead of yellow.

Felder's type-specimen agrees with *helena* (L.), except in the reddish colour of the hindwings.

Hab. Java (17 ♂, 20 ♀); S.W. Sumatra.

(b) : **T. helena nereis** (Doherty) [♂, ♀].

- ♂ ♀. *Ornithoptera nereis* Doherty, *Journ. As. Soc. Beng.* p. 30. n. 47 (1891) (Engano I.; "nearest the South Indian *O. minos*" *ex err.*).
 ♂ ♀. *Ornithoptera* (*Pompeoptera*) *nereis*, Rippon, *Icon. Ornith. text & plate* (1892) (Engano; "the affinity of the species is with *O. minos*, of Southern India" *ex err.*).

This form combines the characters of the Javan *helena* (L.) and the Indo-Malayan *helena cerberus* (Feld.); the *male* comes very close to *cerberus* (Feld.), while the *female*, of which unfortunately only one example is known, is scarcely distinguishable from certain specimens of *helena* (L.).

♂. Of the size of the Java specimens of *helena* (L.). Forewings black, with the nervules, especially the two upper median ones, bordered with white; these whitish streaks are very narrow, and become clouded with black towards the cell. Hindwings with a long yellow mark in front of the subcostal vein, as in *cerberus*; this mark is nearly of equal breadth, much narrower than it usually is in *cerberus*, and does not reach to the costal vein. The subdiscal black spots are very small; they vary in number from 1 to 5; the posterior one is much the largest. The spot between the subcostal and upper discoidal veins, which is, together with that between the lower median nervules, the last to disappear in *helena*, is only in one of my five *males* marked.

♀. Forewings with as much white as in the palest individuals of *helena* (L.); apical third of the cell almost pure white, with two very thin black lines, one in the middle, the other in the direction of the upper median nervule; the adnervular white streaks more sharply limited than in *helena* (L.). The yellow region of the hindwings is rather pale, probably owing to the specimen being somewhat worn. The subdiscal black spots are large, and merged together with one another and with the black marginal band. The basal-costal black area reaches as far as the origin of the subcostal nervule, as in *T. helena cerberus* (Feld.).

Hab. Engano Island (5 ♂, 1 ♀).

(c) : **T. helena propinquus** subsp. nov. [♂, ♀].

Resembles in both sexes the Indo-Malayan *T. helena cerberus* (Feld.), but differs in the following points:—

♂. The forewings are a little shorter; the abdominal margin of the hindwings more broadly black, so that the yellow mark behind the cell is smaller; the black outer border of the hindwings narrower at the nervules; the abdomen blacker above.

Forewings deep black on both sides; below with four geminate, white, submarginal streaks at the median and the second discoidal nervules. The streaks do not reach the outer margin of the wing; the posterior ones are the shortest; that in front of the second discoidal vein is obsolete. At the apical third of the upper discoidal nervule there are also some white scales,

The hindwings have a large yellow mark between the costal and subcostal veins; this mark is shaped as in *T. helena cerberus* (Feld.), i.e. it is broadest towards the margin and reaches here the costal nervure. The yellow spot behind the cell extends along the lower median nervule as far as a third of the way from the cell to the end of the nervule. The outer margin is rather strongly dentate; the black border is more deeply scalloped than it usually is in *helena* (L.) and *helena cerberus* (Feld.). There are four black subdiscal spots: the first stands between the subcostal and upper discoidal veins, and is as small as the third, which is situated between the upper median nervules; the second is point-like, and stands before the upper median nervule; the fourth, which is about six times the size of the first and third, stands between the lower median veins, and is merged together with the marginal marking.

Abdomen yellow; upper surface black, with the middle of the fourth and fifth segments feebly fuscous, and the edges of the fifth to seventh segments narrowly yellow.

♀. The black border to the hindwings narrower at the nervules than in *T. helena cerberus* (Feld.). The abdomen is blacker above; the yellowish white colour of the sides is less extended; the five basal segments are black below, edged with yellow, instead of yellow, spotted with black.

The adnervular white streaks of the forewings are very prominent on both sides, narrow, and sharply defined; those at the subcostal nervules are much clouded with black, except at the cell; they are united in pairs; the bases of the two streaks between the two lower median veins are shaded with black; the streak behind the third median nervule is obsolete, except towards the outer margin; the two streaks at the submedian nervure are broad and short, and have the same position as in *helena* (L.).

The basal-costal black region of the hindwings does not extend beyond the origin of the submedian nervule; before the subcostal vein there is a yellow submarginal mark; the subdiscal black spots are joined to the black marginal border by means of a few black scales; the submarginal and the subdiscal black spots at the anal angle are merged together with the black abdominal margin above. Below, that submarginal spot is partly encircled by a yellowish buff half-ring. The abdomen is much darker than in the other forms of *helena* (L.); the sides are feebly greyish yellow, the lateral black spots (upon the stigmata) are large. Below, the five basal segments are brownish black, with the hinder edges thinly yellow; the sixth and seventh segments are yellow, with a black spot on each side; the eighth and ninth yellow.

Hab. Sambawa (1 ♂, 1 ♀, in coll. Dr. Staudinger).

(d) : **T. helena cerberus** (Feld.) [♂, ♀].

♂ ♀. *Papilio pompeus*, Gray (*acc* Cramer, 1775), *Cat. Lep. Ins. B. M.* 1. p. 5. n. 13 (1852) (*p.p.*); id., *List Lep. Ins. B. M.* 1. p. 5. n. 15 (1856) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 291. n. 28 (1864) (*p.p.*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 235. n. 4 (1869) (*p.p.*).

♂ ♀. *Ornithoptera pompeus*, Horsfield & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 87. n. 177 (1857) (*p.p.*); Moore, *P. Z. S.* p. 756 (1865) (Bengal); Wood-Mas., *Journ. As. Soc. Bengal* p. 252 n. 94 (1881) (Andaman Is.; *heliacowides* Moore - *pompeus* Cram.); id. & Nicév., *l.c.* p. 373. n. 171 (1886) (Cachar); Watson, *Journ. Bomb. N. H. Soc.* p. 26 (1888) (Burma); Elwes, *Tr. Ent. Soc. Lond.* p. 422. n. 394 (1888) [Sikkim; not so common as the last (*rhadananthus*)]; Nicév., *Journ. Bomb. N. H. Soc.* p. 387. n. 86 (1890) (Chin-Lushai); id., *Gazetteer of Sikkim* p. 170. n. 459 (1894) [Sikkim; still more common than the preceding (*rhadananthus*)].

♂ ♀. *Papilio cerberus* Felder, *Verh. z. b. Ges. Wien* p. 291. n. 31 (1864) (Darjeeling; Silhet; *nom. nud.*); id., *Reise Novara, Lep.* 1. p. 19. n. 10 (1865) (Ind. sept.).

♂ ♀. *Ornithoptera heliconoides* (!) Moore, *P. Z. S.* p. 592 (1877) (Andaman Is.).

- ♀. *Ornithoptera ruficollis*, Butler, *Tr. Linn. Soc.* (2), *Zool.* 1. p. 552. n. 1 (♀, *nee* ♂) (1877) (Malacca).
- ♂ ♀. *Ornithoptera heliconoides*, Wood Mason & Nicéy., *Journ. As. Soc. Beng.* p. 237. n. 65 (1880) (Andaman Is.).
- ♂ ♀. *Ornithoptera hephaestus*, Distant, *Rhop. Mal.* p. 328. n. 2. t. 27. f. 2 (♀ ab.), 3 (♂), 4 (♀) (1885) (Mal. Pen.); Weymer, *Stett. E. Zeit.* p. 270 (1885) (Nias); Hagen, *Fris* VII. p. 18. n. 3 (1894) (*p.p.*; Sumatra).
- ♂ ♀. *Ornithoptera cerberus*, Stauding. & Schatz, *Exot. Schmett.* I. p. 4. t. 2 (♂) (1884) (N. India: "Java" *loc. corr.*); Fickert, *Zool. Jahrbüch.* p. 732. n. 2. (1889); Swinhoe, *Tr. Ent. Soc. Lond.* p. 311. n. 372 (1893) (Khasia Hills; common).
- ♂ ♀. *Papilio (Ornithoptera) cerberus*, Robbe, *Ann. Soc. Ent. Belg.* p. 123. n. 1 (1892) (Darjeeling; Kurseong).

The differences between *cerberus* (Feld.) and *helena* (L.) are slight, and so inconstant that it is in many cases impossible to say without the help of locality to which of these two *helena* forms a specimen belongs. It must be understood that the distinguishing characters, as they are pointed out below, are very seldom combined in one specimen, and that in a great number of individuals only one or the other of these characters will be met with. So we shall find that if a *nude* specimen from India is, for example, identical with a Javan individual in the pattern of the hindwings, the forewings of the Indian individual are longer and narrower, or are blacker, or have the adnervular streaks, if present, better defined and narrower, or of a yellowish colour, and so on.

♂. Generally larger than the Javan *helena* (L.), the forewings a little narrower. The forewings are often all black on both sides; in many specimens there appear below adnervular whitish streaks, which are either submarginal and rather short (especially often in Bornean examples), or stand immediately behind the cell, or extend from near the outer margin to the cell and are confluent in pairs at the median vein; in the latter case the streaks at the median and lower discoidal veins are very prominent, though narrow, and appear sometimes on the upperside; these markings assume often a yellow colour, especially at the base of the lower median nervule.

The hindwings have usually a long and broad yellow mark before the subcostal vein; this spot is broadest exteriorly, and reaches here the costal vein; sometimes this spot is reduced to a small submarginal mark, or is even quite obliterated. The submarginal black spots are more often absent than in *helena* (L.); the spot between the subcostal and upper discoidal veins, if present, is usually much smaller than in *helena*; that between the two lower median nervules stands mostly farther from the margin, owing to the anal angle being a little more prominent in *cerberus* (Feld.), and forms, therefore, when merged together with the black margin, a longer streak than in *helena*.

♀. The forewings are often all black, with the veins feebly paler; mostly they have white adnervular streaks above and below; these streaks are narrower and much better defined than in *helena* (L.), and are united in pairs at the cell; the black internervular streaks are, therefore, broader, especially towards the cell, and are not or feebly suffused with white on the disc. The apex of the cell, which in *helena* is more or less uniformly white or grey, is either black like the rest of the cell, or it is bordered white and bears a short white streak in the middle that joins the white cellular border and forms [as in *T. darsius* (Gray)] a mark resembling the letter M; the black portion included in this mark is seldom clouded with white.

On the hindwings the basal-costal black region is generally, though not always, more restricted than in *helena*, not extending beyond the origin of the subcostal nervule;

between the costal and subcostal veins there stands a submarginal yellow spot which varies in size and is seldom absent; within the same cellule there is often also a discal yellow mark. The subdiscal black spots are in most individuals not joined to the marginal border of the wing, but this character is exceedingly variable in both *helena* and *cerberus*; the number of those spots varies as in *helena*.

A single *female* specimen from Banguay Island (in coll. Dr. Staudinger) is remarkable in having the discal spot before the subcostal vein of the hindwings enlarged, and the cellule in front of the abdominal fold filled up with yellow, the subdiscal and submarginal black spots within this cellule being small and standing separate from one another. The abdomen of this specimen is rather more extended yellow, the ventral black spots being very small.

Another *female* in Dr. Staudinger's collection, from Nias, agrees in the pattern of the forewings exactly with *T. helena cerberus* (Feld.); the subdiscal black markings of the hindwings are, however, merged together with each other and with the black border of the wing.

Hab. N. India (Assam, Sikkim; 18 ♂, 28 ♀); Burma; Malacca (1 ♂, 3 ♀); Audaman Islands (1 ♂, 3 ♀); Sumatra (1 ♀); Nias (1 ♀); Natuna Islands (1 ♂, 1 ♀); Borneo (3 ♂, 3 ♀); Banguay Island (in coll. Staudinger).

Note.—Fickert, *l.c.* p. 732, says: "*Ornithoptera cerberus* kommt hauptsächlich in Vorderindien (Sikkim) vor, doch besitzt sie *Staudinger* aus der *Sommer'schen* Sammlung auch von Java (das hiesige zoologische Institut, welches ein grösseres Material *Ornithopteren* aus Java besitzt, hat sie nicht dorthier). *Staudinger* möchte deshalb *cerberus* nicht, wie *Kirby* es thut, als Localvarietät zu *pompheus* ziehen, da zwei Localvarietäten nicht auf einer Insel, auch wenn sie so gross ist wie Java, vorkommen können, eine Ansicht, welche ich, vorausgesetzt dass *cerberus* wirklich auf Java vorkommt, nur theilen kann." Fickert refers to Staudinger, whose opinion about this question is expressed in *Exot. Schmett.* I. p. 1 (1884). As in the second edition of *Exot. Schmett.* the same passage occurs, I cannot forbear to state that Staudinger and Fickert are wrong in two points:—

1. An island "as large as Java" can not only be inhabited by two local forms of the same species, but it can even produce two local forms. Messrs. Staudinger and Fickert forget that the fauna of the mountains is different from that of the lower districts, and that many mountain insects are local forms of the species of the plains or hills; thus *T. amphrysus* (Cram.) has at higher elevations developed into *T. amphrysus canifeifer* (Oberth.). Frühstorfer [*Ent. Nachr.* p. 169 (1895)] shows that a good number of species are different in West and East Java. The species inhabiting Eastern Sumatra, *i.e.* the plains and hills of Sumatra, are often represented by local forms in the mountainous districts of Western Sumatra; the latter districts are indeed as closely allied in their fauna to Java as to the faunae of Deli, Malacca, and Borneo. Wallace's opinion that Sumatra belongs faunistically together with Malacca and Borneo, and is well separated from Java, applies only to East Sumatra, not to West Sumatra, and this explains why the islands near the west coast of Sumatra (Engano, Nias; the fauna of the others we do not know) have so many affinities to Java, not to "Sumatra," *i.e.* not to *Eastern Sumatra*.

2. Though the specimens of Sommer's collection may have been wrongly labelled—Staudinger says in a letter to us that he no longer believes them to be from Java—there occur specimens of *cerberus* which are not distinguishable from certain examples of *helena* (L.) (= *pompheus* Cram.). But that agrees exactly with the

character of a subspecies (local form, *Localvarietät*). Staudinger himself was, to my knowledge, the first to draw attention to the important fact—important to the study of the origin of the species—that a certain form can be individual variety, *i.e.* *aberration* (“Aberration” of Staudinger), occurring together in the same locality with the typical form (“Stammform” of Staudinger) of the species, and at the same time local variety, *i.e.* *subspecies* (“Varietät” of Staudinger), being confined to countries from where the typical form is absent. Eimer (*Entstehung d. Arten*, Jena, 1882; *Artbildung b. Schmettl.*, Jena, 1889) and Fickert (*l.c.*) explain the same fact: and the chief law of the development of the local forms in Eimer’s *Untersuchungen*, etc., a law which can be traced in all variable species of the Indo-Australian Regions, is indeed this: the local forms have no entirely new characters by which they are distinguished from the respective typical form and its aberrations: all the distinguishing characters of a local form are more or less obviously indicated in the individual aberrations of the typical form, and are only further developments of certain characters of the typical form. The differences between *Troides helena* (L.), [= *pompeus* (Cram.)] and *cerberus* (Feld.) are not at all constant; the most developed *helena* and the least advanced *cerberus* are indistinguishable. There are even Indian *cerberus* which are rather less advanced than certain Javan *helena*; the occurrence of every intergradation proves that we have not two, but one species, which develops in one district in this, in another in that direction, and of which the development is not yet so far advanced as to render the intergraduate individuals between the various forms extinct.—K. J.

(e): **T. helena hephaestus** (Feld.) [♂, ♀].

- ♂ ♀. *Papilio hephaestus* Felder, *Verh. z. b. Ges. Wien* p. 291. n. 29 (1864) (Celebes; *nom. nud.*): *id.*, *Reise Novara, Lep.* I. p. 16. n. 8 (1865) (Celebes).
 ♂ ♀. *Ornithoptera leda* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 39. n. 8 (1865) (Macassar; Menado).
 ♂ ♀. *Papilio pompeus* var. *hephaestus*, Hopffer, *St. t. E. Zeit.* p. 18. n. 2 (1874) (Celebes); Snellen, *Tijdschr. v. Ent.* XXI. p. 37. n. 146 (1878) (Saleyer; Bonthain; Bantimoerong).
 ♂ ♀. *Ornithoptera hephaestus*, Oberthür, *Et. d'Ent.* IV. p. 31. n. 12 (1879) (Celebes); Holland, *Proc. Boston Soc. N. H.* XXIV. p. 77. n. 124 (1890) (S. Celebes); Rothschild, *Iris* V. p. 442 (1892) (S.E. Celebes).
 ♂ ♀. *Ornithoptera pompeus* var. *hephaestus*, Fickert, *Zool. Jahrbüch.* p. 729. n. 1a (1889) (Celebes).

This subspecies comes nearest to the Indian race, with which it has been confounded by Distant and other authors. The forewings are of the same elongate shape as in *cerberus*; the outer margin of the hindwings is less scalloped than in the other forms of *helena* (L.), especially in the *male*; the black border to the hindwings is conspicuously broader at the nervules, and therefore not so prominent within the cellules as in *helena* (L.), *cerberus* (Feld.), *neréis* (Doherty), and *propinquus* m. The white spots of the marginal fringe of the forewings are reduced in length.

♂. The forewings are mostly quite black, but have sometimes the bases of the median nervules below bordered with whitish scaling; at the submedian nervure there stands on the underside often a white or yellowish patch, which is in some examples very large.

The hindwings have a large yellow spot before the subcostal vein, as in *cerberus* (Feld.); there are no subdiscal black markings, except one between the lower median nervules which is nearly always confluent with the black marginal border of the wing; in one of my specimens there is also a minute subdiscal black spot between the two upper median veins, but only on the right wing.

♀. The forewings are, above, all greenish black; or the cell bears an apical white mark, as in *cerberus* (Feld.), and the subcostal, discoidal, and median nervules are bordered with white. Below, there is always a large white patch upon the subcostal nervure, even when there are no white markings at the other veins; the median and discoidal nervules bear towards the outer margin often short geminate streaks; in the specimens with much white above, the streaks are broader and whiter below than on the upperside.

The costal-basal black region of the hindwings extends, as in typical *helenus* (L.), beyond the origin of the subcostal nervule; most specimens have a submarginal yellow spot before the subcostal vein; the subdiscal black spots stand either isolated, or are partly joined to the black border of the wing; the yellow mark behind the lower median vein is sometimes rather reduced on the upperside; below, the yellow markings are sometimes much shaded with creamy buff scales.

Hab. Celebes (4 ♂, 10 ♀); Saleyer.

20. *Troides aeacus* (Felder) [♂, ♀].

- ♀. *Ornithoptera rhadamanthus* Boisduval (*nec rhadamantus* Lucas, 1835), *Spec. Gén. Léop.* I. p. 180. n. 8 (♀, *nec* ♀ var. A, *nec* ♂) (Cochin China; *nec* Manila).
- ♂ ♀. *Ornithoptera rhadamanthus*, Doubl. Westw. & Hew., *Gen. Diurn. Léop.* I. p. 4. n. 10 (1846) (Cochin China; India); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 88. n. 178 (1857) (Darjeeling); Reakirt, *Proc. Ent. Soc. Phil.* p. 444. n. 1 (1864) (*p.p.*); Moore, *P. Z. S.* p. 755 (1865) (Bengal); Drnce, *P. Z. S.* p. 108. n. 1 (1874) (Siam); Dist., *Rhop. Mal.* p. 326. n. 1. t. 27a. f. 5 (♂) & p. 327. f. 106 (♀) (1885) (Mal. Pen.); Wood-Mas. & Nicéville, *Journ. As. Soc. Beng.* p. 373. n. 172 (1886) (Cachar); Elwes & Nicéville, *ibid.* p. 438. n. 148 (1886) (Tavoy & Simboodine); Elwes, *Tr. Ent. Soc. Lond.* p. 422. n. 393 (1888) (Sikkim; common in hot valleys at 2000 to 3000 feet); Manders, *ibid.* p. 535. n. 185 (1890) (Shan States; very common in low valleys. 800 to 3000 feet); Watson, *Journ. As. Soc. Beng.* p. 53. n. 205 (1891) (Chin Lushai); Swinhoe, *Tr. Ent. Soc. Lond.* p. 311. n. 371 (1893) (Kbasia Hills); Leech, *Butterfl. of China*, etc. p. 513 (1893) (*p.p.*); Nicéville, *Gazetteer of Sikkim* p. 170. n. 457 (1894) (Sikkim; common in low valleys from May to October).
- ♂ ♀. *Papilio rhadamanthus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 6. n. 14 (1852) (*synon. p.p.*; Nepal; Moulmein; Hong-Kong); id., *List Lep. Ins. B. M.* I. p. 5. n. 16 (1856) (*synon. p.p.*).
- ♀. *Ornithoptera aeacus* Felder, *Wien. Ent. Mon.* IV. p. 225. n. 71 (1860) (*patria?*).
- ♀. *Papilio aeacus* Felder, *Verh. z. b. Ges. Wien* p. 291. n. 32 (1864) (*patria?*).
- ♂. *Ornithoptera rhadamanthus* var. *amphrisius*, Kirby, *Cat. Diurn. Lep.* p. 519. sub n. 9 (1871) (Ind. bor.); Stauding. & Schatz, *Erol. Schmett.* I. p. 4 (1884) (Sikkim); Fickert, *Zool. Jahrbuch.* p. 734. sub n. 3 (1889) (N. India).
- ♂. *Ornithoptera rhadamanthus* var. *thomsoni* Bates, in Thomson's *Straits of Malacca*, etc. p. 546 (1875) (Siam).
- ♂ ♀. *Ornithoptera minos*, Oberthür, *Et. d'Ent.* IV. p. 32. n. 14 (1879) (Burma); id., *loc.* XI. p. 14 (1886) (Ta-tsiensin).
- ♂ ♀. *Papilio (Ornithoptera) rhadamanthus*, Nicéville, *Journ. As. Soc. Beng.* p. 98. n. 255 (1883) (Sikkim).

Felder's type of *aeacus* agrees with the Indian *females* of that species which most authors erroneously enumerate as *T. rhadamanthus*. The present *Troides* differs from the true *rhadamantus* (Lucas) from the Philippines so markedly that I must contradict Fickert, Staudinger, Leech, and others, who say that *rhadamantus* (Lucas) and *aeacus* (Feld.) belong to one species. About "*amphrisius* (Lucas)." "*rhadamanthus* (Boisd.)," see *T. rhadamantus* (Lucas), p. 225.

Bates's "*var. thomsoni*" from Siam is based on a specimen with the abdomen rather more extended yellow; the Siamese examples which I have examined can, however, not be separated from the North Indian ones; they are often smaller than the latter, and the forewings of the very small individuals are rather strongly falcate; but there occur in Siam also small (and large) specimens, of which the forewings are

less concave at the outer margin than in the North Indian and Chinese individuals. Very small specimens are also often found in the Malay Peninsula.

The specimens from the Thibetian frontier of China differ mostly in both sexes from the Indian ones. In the *male*, the adrenular white stripes on the underside of the forewings are much less tinged with yellow; indeed, in most examples the stripes are unicolorous; the abdomen has two rows of black spots on the underside (besides the spots upon the stigmata) which are not present in the Indian, Central and Eastern Chinese, Siamese, and Malaccan individuals. In the *female*, the black spots of the underside of the abdomen are large and mostly merged together; the yellow mark of the hindwings which stands behind the median nervure is absent or very small. Most probably the *aeucus* from Thibet proper and from the northern slopes of the Himalaya will be more different from the type than those West Chinese specimens, and will have to stand as a separate subspecies.

♂. Differs from *T. rhadamantus* (Lucas) especially in the abdominal segments being edged with yellow on the upperside, in the less produced abdominal angle of the hindwings, and in the much shorter basal partition of the median nervure of these wings.

The forewings, which are longer than in *rhadamantus* (Lucas), are rather variable in shape; sometimes, especially in very small specimens, which are more abundant in Malacca, Tenasserim, and Siam than in North India and China, they are rather falcate. On the hindwings, the black scaling at the marginal spots between the median branches is often rather extended; in one Malaccan individual there are also black scales within the cell; many specimens have one or two minute black subdiscal spots between the median nervules; on the underside, which is devoid of the admarginal black scaling, these spots are in some individuals from China rather large.

♀. The white stripes on the forewings are often very broad; in the Malaccan specimens they are usually narrower than in the North Indian and Chinese examples; Felder's type takes in this respect an intermediate position; the whitish border to the cell of the forewings is in many individuals very broad, and is sometimes so enlarged as to fill up nearly the whole cell, exclusive of two longitudinal streaks.

The discal yellow spot in front of the subcostal vein of the hindwings is seldom absent. The discal and submarginal black spots are never merged together, though the two posterior pairs, between the median nervules, stand sometimes very close together, and though the yellow markings between these two pairs are rather densely overpowdered with black scales, especially on the upperside.

Hab. North India (Sikkim, Assam) (8 ♂, 6 ♀); Burma and Shan States (8 ♂, 2 ♀); Tenasserim (2 ♂); Malacca (5 ♂, 6 ♀); Siam (1 ♂, 1 ♀); China (17 ♂, 13 ♀).

21. *Troides rhadamantus* (Lucas) [♂, ♀, metam.].

♂ ♀. *Papilio astenous*, Eschscholz (*nov. Fabricius*, 1775), *Kotzebue's Reise* III. p. 205. t. 4. f. 6a. 6b. 6c (♂, ♀) (1821) (Manila).

♂ ♀. *Ornithoptera rhadamantus* Lucas, *Lép. Exot.* p. 5 (1835) (Philippines).

♂. *Ornithoptera amphrisius*, Lucas (*nov. Fabric.*, 1787), *Lép. Exot.* t. 2. f. 1 (1835) (Philippines); *comp. note on p. 5*: "lisez *rhadamantus* au lieu d'*amphrisius*".

♂ ♀. *Ornithoptera rhadamantus*, Boisduval, *Spéc. Gén. Lép.* t. p. 180. n. 8 (1836) (♂ et var. A ♀; Manila; *nov. Cochin China*); Reakirt, *Proc. Ent. Soc. Phil.* p. 444. n. 1 (1864) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 32. n. 16 (1879) (Manila); Dowitz, *Nov. Act. Kais. Leop. Ac. Nat.* XLV. n. 2. p. 262. t. 2. f. 7A. 7B (*l., p.*) (1882); Stauding. & Schatz, *Exot. Schneitt.* I. p. 4.

- t. 1 (♂, ♀) (1884); Fickert, *Zool. Jahrbüch.* p. 733. n. 3 (1889); Leech, *Butterfl. of China*, etc. p. 513 (1893) (*p.p.*).
- ♂ ♀. *Papilio nephereus* Gray, *List Lep. Ins. B. M.* I. p. 6. n. 17 (1856) (Philippine Is.: "Hong-Kong" *loc. err.*).
- ♂ ♀. *Papilio rhadamanthus*, Felder, *Verh. z. b. Ges. Wien* p. 291. n. 26 (1864) (*p.p.*).
- ♂ ♀. *Ornithoptera nephereus*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 40. n. 10 (1865); Stauding., *Iris* II. p. 4 (1889); Semper, *Philipp., Tagfalt.* p. 264. n. 386 (1891) (*on most of the Philippine Islands all the year round*).

Lucas described this Philippine insect in 1835 under the name of "*rhadamantus* Boisd.;" as Boisduval's *Spec. Gén. Lép.* I. came out after Lucas's *Lép. Exot.* Lucas has the priority, and the name of *rhadamantus* must be spelt without an *h* behind the *t*. Lucas gives Boisduval as author; from this I conclude that he received the name of the insect from Boisduval *in litt.*

Boisduval's "*rhadamanthus*" of *Spec. Gén. Lép.* is a composite species; he describes first the Philippine *male*, then the *female* of the Indo-Chinese representative species, and thirdly, as var. A, the proper *female* to his Philippine *male*. As most authors did not perceive that Boisduval's description of the *male* applies to the Philippine, not to the Indo-Chinese species, and recognised the "var. A" as the Philippine *female*, they erroneously used the name of "*rhadamanthus* Boisd." for the Indo-Chinese Papilionid, not for the Philippine one. Gray was the first to make this muddle; he bestowed a new name upon the Philippine species, and called the Indo-Chinese insect "*rhadamanthus* Boisd.," and nearly all the authors writing upon the Indian fauna follow him.

Lucas calls the species "*amphrisius*" on the plate (not in the text), but corrects this misprint in a note on page 5. In Kirby's Catalogue "*amphrisius* Lucas" is said to be from North India; Staudinger & Schatz in *Exot. Schmett.* I. p. 4 (1884), and Fickert in *Zool. Jahrbüch.* p. 734 (1889), uncritically accept this mistake, so that now in most German collections the Indian species stands as "var. *amphrisius* Lucas," the Philippine insect as "*rhadamanthus* Boisd.," while in England the first is known as "*rhadamanthus* Boisd." and the second as "*nephereus* Gray." The proper nomenclature is as follows:—

- (1) *T. rhadamantus* (Lucas): Philippines;
- (2) *T. aeacus* (Felder): India, Malacca, Siam, China.

Two subspecies belong to *T. rhadamantus* (Lucas):—

(a): **T. rhadamantus** (Lucas), forma typ. [♂, ♀, metam.].

♂. The anal region of the hindwings is strongly produced and pointed; the branches of the median nervure stand rather closer together than in the other species of *Troides*; the basal portion of the median vein is very long, more than half as long again as the corresponding part of the subcostal nervure. The median cellules of the hindwings above are sometimes (chiefly in Mindoro specimens) shaded with a rather dense black scaling, which occupies, besides the median cellules, often also part of the discoidal cell.

The adnervular streaks of the forewings are always whitish and very narrow; below there is sometimes a feeble spot at the submedian nervure which assumes a yellowish colour.

The abdomen is entirely black above, the segments not being edged with yellow, as in the Indian allied species.

♀. The white mark in the apex of the cell has the same form as in *T. helena*.

cerberus (Feld.). The adnervular white streaks of the forewings seem to be as constantly present above and below as in the *male* sex; the markings at the submedian nervure are mostly feebly marked on the upperside; sometimes they are entirely absent from both sides of the wing.

On the hindwings there is in some specimens a rather large yellow discal spot before the subcostal vein; the length of the discal yellow markings is variable. The black border of the wings includes usually a series of geminate, adnervular, yellow spots of variable size; these spots are larger below than above.

The abdomen bears beneath two series of black spots, of which those upon the fifth to seventh segments are larger; the spots are sometimes confluent with one another.

Hab. Philippine Islands (recorded from nearly all the islands) (14 ♂, 15 ♀).

(b): ***T. rhadamantus plateni*** (Staudinger.) [♂, ♀].

♂ ♀. *Ornithoptera plateni* Staudinger, *Iris* I, p. 274 (1888) (Palawan); id., *l.c.* II, p. 3 (1889) (Palawan); Fickert, *Zool. Jahrbüch.* p. 762 (1889).

♂ ♀. *Ornithoptera (Priamoptera) plateni*, Rippon, *Icon. Ornith.* text & plate (♂, ♀) (1890) (Palawan).

There is a *female* specimen in my collection with the locality "Palawan" attached to it which is so very close to the *female* of *T. rhadamantus* (Lucas) that I had much doubt whether it really came from that island, till I found in Staudinger's careful description of *plateni*, in *Iris* II, a similar Palawan specimen mentioned. Staudinger says that his specimen is distinguishable from the Philippine *females* only by the yellow discal markings of the underside of the hindwings being shaded with whitish or grey, and by the adnervular, submarginal spots of the same wings below being conspicuously large and whitish grey. The first of these two characters appears, however, also in certain *rhadamantus* females, though the peculiar creamy buff shade is less extended. The second character does not apply to my *rhadamantus*-like *female* of *plateni*; the submarginal spots are small and yellow, except the two anterior ones, which are, as in some Philippine *females*, creamy buff. This proves, however, that the *females* of *plateni* and *rhadamantus* cannot be separated specifically. In the *male* sex, the difference between the dark Mindoro individuals, with the median cellules and part of the discoidal cell overpowdered with black scales, and those examples of *plateni* which exhibit dispersed yellow scales within the black region of the hindwings, is again rather slight. Staudinger says himself (*l.c.*) that *plateni* is perhaps only a local form of "*nephereus* Gray" [recte *rhadamantus* (Lucas)], and I must adopt this opinion. *T. rhadamantus plateni* (Staudinger.) is certainly one of the most interesting forms of *Troides*, especially so as it forms a transition to the *T. dohertyi* (Rippon) with an entirely black upperside to the hindwings.

♂. The yellow area of the upperside of the hindwings is mostly reduced to two spots standing between the costal margin and the upper discoidal vein. Many specimens have a third small mark behind that nervule, and in one of Staudinger's examples this mark is so much enlarged as to reach the second discoidal vein. Within the cell there is often a narrow yellow streak along the subcostal nervure. Below, the yellow area consists of eight large spots; the area appears greenish in certain lights as far as the black colour of the upperside is extended. The median cellules are often almost black; sometimes they have only a black sprinkling, or are almost pure yellow.

The adnervular streaks of the forewings are mostly very faint on the upperside, but sometimes they are almost as white as in *rhadamantus* (Lucas).

♀. The hindwings have, besides the large cellular spot which occupies the whole cell, exclusive of the extreme base, from 4 to 7, often rather small, discal markings; the black border of the wing includes often one or two small yellow or yellowish buff submarginal spots. Below, the yellow discal area is more or less shaded with creamy white.

Hab. Palawan (8 ♂. 7 ♀).

22. *Troides dohertyi* (Rippon) [♂, ♀].

♂ ♀. *Ornithoptera (Pompeoptera) dohertyi* Rippon, *Ann. Mag. N. H.* (7). II. p. 295 (1893) (Talaut I.); id., *Icon. Ornith. text & 2 plates* (♂, ♀, aberrs.) (1893).

♂ ♀. *Papilio vordermani* Snellen, *Tijdschr. v. Ent.* XXXVII. p. 191 (1895, June) (Talaut).

♂. The upperside is all black, the adnervular white streaks of the underside showing through above. The amount of yellow on the underside of the hindwings is very variable; the anterior spots between the costal nerve and the upper discoidal nervule are usually the smallest and disappear first. Within the apex of the cell there is sometimes a minute yellow mark.

♀. All the specimens of this sex which Mr. W. Doherty obtained seem to be much faded, and are of a light brown colour, recalling the same sex of *T. haliphron iris* (Röber). The hindwings are above often unicolorous; most specimens have, however, four irregular and small yellow discal spots round the apex of the cell, and a very feeble mark within the end of the cell. Sometimes there are also some very faint submarginal yellowish spots marked on the upperside. Below, these spots are larger and of a creamy buff colour, often much overpowdered with brownish black scales; the submarginal spots are sometimes extended along the nervules and joined to the marginal, internervular spots, forming U-shaped markings; the space within such a mark is occasionally more or less filled up with buffish scales.

Hab. Talaut, north of Celebes (W. Doherty coll.) (18 ♂. 7 ♀).

It is not improbable that on one of the islands between Celebes and the Philippines exists a *Troides* species which has totally lost the yellow markings; and there may also be, for example on the Sulu Islands, a *Troides* which connects *dohertyi* (Rippon) with *plateni* (Stauding.).

23. *Troides mirandus* (Butl.) [♂, ♀].

♂ ♀. *Papilio miranda* Butler, *Lep. Exot.* I. p. 3. t. 1 (♂) (1869) (Sarawak).

Ornithoptera miranda, Druce, *P. Z. S.* p. 356. n. 1 (1873) (Sarawak); Oberth., *Et. d'Ent.* IV. p. 110. n. 9, bis (1879) (Borneo); Dist. & Pryer, *Ann. Mag. N. H.* (5). XIX. p. 272. n. 165 (1887) (Sandakan).

Collar yellow in both sexes.

♂. The black border to the hindwings is slightly variable in breadth; otherwise very constant.

♀. The forewings have on the upperside sometimes a complete series of white, geminate, linear markings, of which those between the subcostal veins are connected at the base in pairs; in other specimens these markings are nearly entirely obliterated; below, the markings are more pronounced than above.

The amount of yellow on the hindwings is very inconstant; the yellow area occupies in one of my specimens three-quarters of the cell, in others only half the cell; in others again there is, moreover, a rather large black spot in the apex of the

cell; the yellow discal spots between the discoidal and upper median veins are sometimes obliterated; occasionally all the yellow markings are much shaded with black. The tear-shaped black discal markings are in some individuals well defined; in others they are all merged together.

Hab. North Borneo (4 ♂, 7 ♀).

24. *Troides andromache* (Stauding.) [♂, ♀].

♂ ♀. *Ornithoptera andromache* Staudinger, *Iris* V. p. 393 (1892) (N. Borneo); id., *l.c.* VII. p. 341. t. 8. f. 1 (♂). 2 (♀) (1895) (Kina Balu, 1200 to 1500 metres).

Collar red in both sexes.

♂. Forewings small, black, with a blue tint, which is, however, much feebler than in *T. mirandus* (Butl.). In the marginal region the scales of the under layer become often whitish, and in consequence of this there appears sometimes a feebly marked, faintly yellowish, submarginal band on the upperside. Below, the forewings have large, triangular, whitish markings, which shade off towards the disc into yellow, and which remind one of the markings of *T. brookianus* (Wall.).

♀. Recalling *T. amphrysus flavicollis* ♀-ab. loc. *olympiu* (Honr.). The forewings are whitish, exclusive of the outer and costal margin, and, in some specimens, of the base. The cell of the hindwings is all yellow; the yellowish spot behind the cell extends also to the base of the wing; the outer margin is rather less indented than in *T. mirandus* (Butl.), but this character is not constant.

T. andromache (Stauding.) is the representative species of *T. mirandus* (Butl.) at higher elevations.

Hab. Kina Balu (1200 to 1500 m.; 4 ♂, 4 ♀).

Both *T. andromache* and *mirandus* are allied to *T. amphrysus* (Cram.) in the absence of red hairs from the breast underneath the wings, and in the long basal portion of the subcostal nervure of the hindwings. The *males* have also the dorsal markings to the abdomen which we meet with in the forms of *T. amphrysus* (Cram.).

25. *Troides amphrysus* (Cram.) [♂, ♀].

♂. *Papilio Eques Trojonus amphrysus* Cramer, *Pap. Ecot.* III. p. 43. t. 219. f. A. (♂) (1782) (Java).

♂. *Papilio Eques Trojonus amphrysus*, Jablonsky, *Naturg. Schmett.* I. p. 197. n. 2. t. I. f. 3 (1784); Esper, *Aust. Schmett.* p. 133. n. 59. t. 34. f. 1 (1792).

♂. *Papilio Eques Trojonus amphrysus*, Fabricius, *Mont. Ins.* II. p. 3. n. 23 (1787) (Ind. or.); Guélin, *Syst. Nat.* I. 5. p. 2230. n. 287 (1790); Fabr., *Ent. Syst.* III. 1. p. 11. n. 33 (1793) (India).

♂. *Troides amphrysus*, Hübn., *Verz. bek. Schmett.* p. 88. n. 923 (1816).

♂. *Papilio amphrysus*, Godart, *Enc. Méth.* p. 27. n. 7 (1819) (*p.p.*); Gray, *List Lep. Ins. B. M. I.* p. 6. n. 18 (1856) (*p.p.*).

♂ ♀. *Ornithoptera amphrysus*, Boisduval, *Spec. Gén. Léop.* I. p. 178. n. 6. t. II. f. 1 (♂) (1836) (Java; *see* Sumatra); Donbl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 8 (1846) (Java; *see* Penang); Vollenhov., *Tijdschr. v. Ent.* III. p. 71. n. 8 (1860) (*p.p.*); Wall., *Tr. Lim. Soc. Lond.* XXV. p. 40. n. 15 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 30. n. 9 (1879) (*p.p.*).

♂ ♀. *Papilio amphrysus*, Felder, *Verh. z. b. Ges. Wien* p. 291. n. 34 (1864) (*p.p.*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 235. n. 5 (1869) (Java).

♂ ♀. *Ornithoptera amphrysus*, Druce, *P. Z. S.* p. 356. n. 2 (1873) (Java); Stauding. & Schatz, *Exot. Schmett.* I. p. 5 (1884) (*p.p.*); Fickert, *Zool. Jahrbüch.* p. 739. n. 8 (1889) (*p.p.*).

The basal portion of the subcostal vein of the hindwings, from the base to the upper discocellular nervule, is in the ♂ longer than the corresponding part of the median nervure, from the base to the lower median nervule; in the ♀ both parts are

alike, or the first is the longest. In *Troides helena* (L.), *oblongomaculatus* (Goeze), etc., the basal portion of the median vein is obviously longer than that of the subcostal nervure.

This species has developed into four local forms:—

(a): *T. amphrysus* (Cram.) inhabits Java, except the higher mountains, where it is represented by

(b): *T. amphrysus cuneifer* (Oberth.);

(c): *T. amphrysus flavicollis* (Druce) occurs in Sumatra, Malay Peninsula, Borneo, and Banguay Island, and is replaced in the mountainous districts of Sumatra by

(d): *T. amphrysus sumatranus* (Hagen), which corresponds to *T. amphrysus cuneifer* (Oberth.).

The caterpillar and chrysalis are unknown.

(a): **T. amphrysus** (Cram.), forma typ. [♂, ♀].

♂. The yellow colour of the forewings varies in extent; the submedian vein is often entirely black. The submedian, linear, black mark on the upperside of the hindwings, standing between the lower median nervules, is mostly joined to the black border of the wing, but in many individuals it stands separate, and sometimes it is reduced to a point; below it is often absent; in one of my specimens it is much enlarged and partly merged together with the black abdominal margin; in the same example the black marginal spot at the end of the subcostal nervule of the hindwings is extended along that vein half-way to the cell.

The abdomen is yellow, with the upperside of the basal segments brownish; or it is greenish yellow, with the whole upper surface brownish black, exclusive of the fourth and fifth segments, which bear each a paler brown dorsal mark.

The metathorax has, underneath the hindwings, rarely a few red hairs at each side.

♀. The white markings on the forewings are variable in size, and assume sometimes a yellowish colour towards the hinder angle. The yellow disc of the hindwings shades mostly into whitish towards the base and the abdominal margin.

The abdomen varies above from being dirty creamy buff to being olive brown: below it is yellow, or greenish yellow.

(a²): ab. *palabuanus* Fruhst.

Ornithoptera amphrysus var. *palabuanus* Fruhstorfer, *Ent. Nachr.* p. 44 (1894) (Palabuan, S.W. Java).

Adnervular streaks on the forewings darker than in typical *amphrysus*, almost "reddish brown."

Hab. Java (16♂ 6, ♀).

(b): ♂ ♀. **T. amphrysus cuneifer** (Oberth.).

♂. *Ornithoptera amphrysus* ab. *cuneifera* Oberthür, *Et. d'Ent.* IV. p. 110, sub n. 9 (1879) (Java).

♂ ♀. *Papilio* (*Ornithoptera*) *ritsemæ* Snellen, *Notes Leyd. Mus.* p. 153 (1889) (Java; Freanger, Ardjoena, 1500 to 1800 metres).

This mountain-form of *T. amphrysus*, which Mr. Oberthür described as *cuneifer* from a single male ten years before Mr. Snellen published it under the name of *ritsemæ*, cannot be maintained as a distinct species. Mr. P. C. T. Snellen (*l.c.*) differentiates *cuneifer* chiefly by the following characters:—

♂. (1) *T. cuneifer* (= *ritsemæ* Snellen) is smaller than *amphrysus* (Cram.), the

first measuring from 65 to 70 mm. [length of forewing], whereas the latter measures from 76 to 81 mm.

The forewings of my Java *males* of *amphrysus* vary in length from 63 to 78 mm., those of my *cuneifer* from 64 to 80, and those of my Bornean *T. amphrysus* ab. *viricollis* (Butl.) from Borneo 57 to 79.

(2) The upperside of the forewings is rather browner, less black in *cuneifer*.

This is certainly the case in all my *cuneifer*, though some specimens are blacker than others.

(3) The markings of the forewings are less yellow.

The colour of the streaks on the forewings of *amphrysus*, especially of the Bornean form, is often not yellower than in certain *cuneifer*; but in the latter insect the fourth and fifth subcostal and the upper discoidal veins are black or almost so, and the yellowish white colour is, therefore, more restricted, and forms almost a diagonal band, which crosses the wing at the apex of the cell.

(4) The black basal part of the forewing, limited towards the apex by the before-mentioned yellowish white streaks, is horizontally cut off in *amphrysus*, while in *cuneifer* it slopes off towards the outer margin.

This character is very variable, both in *amphrysus* and *cuneifer*, owing to the individually different length of the streak which borders the upper median nervule at its hinder side.

(5) The hindwings have a greener tint in *cuneifer*.

This character seems to be fairly constant.

(6) The veins of the hindwings are in *cuneifer* heavier black than in *amphrysus*.

This is indeed the case; and I may add that the black band at the discal side of the abdominal fold is broader in *cuneifer*.

(7) *T. cuneifer* has on the hindwings from 3 to 6 submarginal black spots.

In my series of *cuneifer* the number of the spots varies from 0 to 5.

(8) In *cuneifer* the marginal black spot between the upper median nervules of the hindwings is more prominent than the other marginal spots.

In one individual of *cuneifer* all the marginal spots are equally prominent (exclusive of that between the lower median nervules); and in some *amphrysus* the spot in question is also more prominent than in the others.

(9) The costal nervure of the hindwings of *cuneifer* is much less arched than in *amphrysus*.

In most specimens of *amphrysus* the costal vein is indeed more arched, but not in all individuals.

(10) The "third and fourth" abdominal segments bear on the upperside a black mark each, which is entirely absent from the abdomen of *amphrysus*.

These spots, which stand on the fourth and fifth, not on the third and fourth segments, are sometimes feebly indicated in Javan *amphrysus*, and rather well marked in many individuals of *T. amphrysus flavicollis* (Druce), though never of so deep a brownish black colour as in *cuneifer*; in the Sumatran representative form of *cuneifer*—namely, in *T. amphrysus sumatranus* (Hagen)—the spots are not developed.

(11) The abdomen of *cuneifer* is deep earth-brown above, greenish yellow at the sides, and yellow below, while in *amphrysus* the four basal segments are of a dull ochreous colour above and at the sides, and the remaining segments and the whole underside yellow.

The abdomen is constant in colour in my *cuneifer*, very inconstant in *amphrysus*.

varying in the latter from being entirely yellow to being above as black as in *cuneifer*; in the specimens with the brownish black upper side of the abdomen the sides of the abdomen are of the same greenish yellow colour as in *cuneifer*.

Thus there remain only the somewhat browner colour of the forewings, the greener tint of the hindwings, and the broader black band along the discal side of the abdominal fold of the hindwings, by which *cuneifer* ♂ is distinguished from *amphrysus* and its local forms. I must add that the hindwings of *cuneifer* are of a different shape, being less rounded in the anal region than in most *amphrysus*, that the scent-organ within the abdominal fold is rather whiter than in *amphrysus*, and that the hind femora are black.

♀. In the *female*, however, there is not a single character by which all the specimens of *cuneifer* can be differentiated from all the specimens of *amphrysus*. In most (not in all) individuals of *cuneifer* the markings of the forewings, chiefly those towards the hinder angle, are more yellowish, and the yellow region of the hindwings is less yellow towards the base and beyond the cell.

Hab. Mountains of Java: Mount Gede, Mount Ardjoena, Preanger (7 ♂, 7 ♀).

(c): **T. amphrysus flavicollis** (Druce) [♂, ♀].

Ornithoptera flavicollis Druce, *P. Z. S.* p. 356. n. 3 (1873) (Borneo); Skertchley, *Ann. Mag. N. H.* (6). VI. p. 210 (1889) (*habits*).

Ornithoptera amphrysus var. *flavicollis*, Oberthur, *Et. d'Ent.* IV. p. 30. sub n. 9 (1879) (Borneo).

Ornithoptera amphrysus var. *flavicollis*, Fickert, *Zool. Jahrbüch.* p. 739. sub n. 8 (1889) (Borneo).

Ornithoptera (*Pompeoptera*) *amphrysus* var. *flavicollis*, Rippon, *Icon. Ornith.* text & plate (1891) (*p.p.*).

Pompeoptera flavicollis, Rippon, *l.c.* t. 10. f. 4 (♀ var.) (1891).

The collar of this subspecies is either yellow or red; the yellow-collared form is confined to Borneo and the adjacent small islands, where it flies together with the red-collared form, and is nothing but a local aberration. As, however, the name of *flavicollis* (Druce) has the priority over the name of *rujicollis* (Butl.), we must apply that name to the subspecies; the name of *flavicollis* includes therefore the red- and yellow-collared specimens. There occur examples in which the collar is yellowish red, and this proves that the colour of the collar is of no specific value.

♂. The black border of the hindwings is obviously narrower than in *amphrysus* (Uram.); the yellowish markings of the forewings are restricted to the marginal region of the wing in most individuals, and seldom occupy so much of the apex of the cell as in *amphrysus*; below, they are decidedly whiter than in the Java insect.

♀. Often scarcely or not distinguishable from *amphrysus* (Uram.); the white patch at the apex of the cell of the forewings is more triangular, being more extended along the subcostal than the median nervure; in many individuals the white colour is much increased on the forewings. The hindwings are less whitish towards the base and beyond the cell; the yellow spot between the costal and subcostal nervures is often larger than in *amphrysus*, especially in individuals with pale forewings.

(a²): ♀-ab. loc. *olympia* (Horn.).

♀. *Ornithoptera* (*Pompeoptera*) *amphrysus* var. *flavicollis*, Rippon (*non* Druce, 1873), *Icon. Ornith.* text & plate (♀) (1891).

♀. *Ornithoptera olympia* Hornath, *Ent. Nachr.* XVII. p. 241 (1891) (S.E. Borneo).

♀. *Ornithoptera flavicollis* var. *olympia* Hornath, *Berl. Ent. Zeit.* XXXVI. p. 429. t. 15. f. 1 (1891).

The white colour of the forewings is much increased; discoidal cell entirely, or

almost entirely, whitish. Collar yellow or red. Black tear-shaped spots of the hindwings large; there is sometimes a black spot within the end of the cell.

This remarkable aberration, which corresponds in characters to the *female* of *T. lydius* (Feld.) of the *priamus*-group, is confined to Borneo.

(b²): ab. *ruficollis* (Butl.).

♂ ♀. *Papilio amphrysus*, Godart, *Enc. Méth.* IX. p. 27. n. 7 (1819) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 6. n. 15 (1852) (Penang; Borneo; "N. India" *loc. err. vel spec. alt.*); id., *List Lep. Ins. B. M.* I. p. 6. n. 18 (1856) (*p.p.*).

♂ ♀. *Ornithoptera amphrysus*, Boisduval (*nec* Fabricius, 1787), *Spec. Gén. Léop.* I. p. 178. n. 6 (1836) (*p.p.*); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 19 (1840) (Borneo); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 4. n. 8 (1846) (Penang; *nec* Java); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 88. n. 179 (1857) (Borneo); Vollenhov., *Tijdschr. v. Ent.* III. p. 71. n. 8 (1860) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 40. n. 5 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 30. n. 9 (1879) (*p.p.*).

Papilio amphrysus, Felder, *Verh. z. b. Ges. Wien* p. 291. n. 34 (1864) (*p.p.*); Snellen, *Notes Leyd. Mus.* p. 153 to 157 (1889) (*p.p.*).

♂. *Ornithoptera ruficollis* Butler, *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 552. n. 1 (♂, *nec* ♀) (1877) (Malacca).

Ornithoptera amphrysus, Kheil, *Rhop. Nias* p. 34. n. 136 (1884) (Nias I.).

♂ ♀. *Ornithoptera ruficollis*, Distant, *Rhop. Mal.* p. 328. n. 3. t. 27. f. 1 (♂). & p. 329. f. 107 (♀). & t. 27a. f. 1 (♀ var.) (1885) (Malay Pen.).

Ornithoptera amphrysus var. *ruficollis*, Fickert, *Zool. Jahrbüch.* p. 739. sub n. 8 (1889); Hagen, *Iris* VII. p. 18. n. 2 (1894) (Sumatra).

Ornithoptera (Pompeontera) amphrysus var. *ruficollis*, Rippon, *Icon. Ornith.* text & plate (1891).

Collar red instead of yellow.

P. C. T. Snellen [*Notes Leyd. Mus.* p. 157 (1889)] reproaches Distant with not having seen that "*Papilio ruficollis* Distant" is exactly identical with "*Pap. amphrysus*" from Sumatra. I do not know whether Distant has compared Sumatran specimens, but if he had done so he would certainly have perceived the identity of the Malaccan and Sumatran insects, and would have righteously referred *both* to *ruficollis*, not to "*Pap. amphrysus*," as the Javan *amphrysus* is not identical with the race of *amphrysus* inhabiting Sumatra, Malacca, and Borneo.

I have a *female* from Padang and two from Nias which stand intermediate between typical *amphrysus* (Cram.) and *amphrysus flavicollis* (Druce).

Hab. Malacca (5 ♂, 1 ♀); Sumatra (1 ♀); Nias (2 ♀); Borneo (26 ♂, 17 ♀); Pulo Laut (1 ♂); Banguey Island (3 ♀).

A form corresponding to *T. amphrysus cuneifer* (Oberth.) and *sumatranus* (Hagen) is not known from Malacca and Borneo. On the Mount Kina Balu only the yellow-collared *flavicollis* (Druce) has been found.

(d): ♂. **T. amphrysus sumatranus** (Hagen).

♂. *Ornithoptera ritsemæ* var. *sumatranus* Hagen, *Iris* VII. p. 19. n. 5 (1894) (Sumatra).

♂. The two black markings on the upperside of the abdomen wanting; otherwise similar to *T. amphrysus cuneifer* (Oberth.).

♀. Not described.

Hab. Mountainous regions of Sumatra.

26. **Troides magellanus** (Felder) [♂, ♀].

♂ ♀. *Ornithoptera magellanus* Felder, *Wien. Ent. Mon.* VI. p. 282. n. 31 (1862) (♂ Babuyan, Luzon); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 40. n. 11 (1865); Fickert, *Zool. Jahrbüch.* p. 740. n. 9 (1889); Semper, *Philipp., Tagfalter*, p. 264. n. 385 (1891) (Babuyan; Polillo; E. Mindanao); Haase, *Untersuch. üb. Min.* p. 29 (1893).

♂ ♀. *Papilio magellanus* Felder, *Verh. z. b. Ges. Wien* p. 291. n. 27 (1864); id., *Reise Norurra, Lep.* I. p. 14. n. 7. t. 5. f. a (♂). b (♀) (1865).

♂. Rather constant; the hindwings have on both sides, when viewed from behind with the eye between light and insect, a strong opalescent gloss.

♀. Felder's type-specimen is rather pale on the forewings, the white adnervular stripes are broader, and the yellow spot before the cell of the hindwings is longer than in other examples. The yellow area has above a distinct trace of the opalescent gloss of the other sex.

Hab. Philippine Islands: Babuyan (1 ♂), Luzon (1 ♀), Polillo (1 ♂, 1 ♀); E. Mindanao.

GENUS **PAPILIO** L., *Syst. Nat.* ed. x. p. 459 (1758).

1. HECTOR-GROUP.

Males devoid of anal valves. Legs similar in structure to those of *Eurygus* Boisd.

27. **Papilio hector** L. [♂, ♀, metam.].

Rajus, *Hist. Ins.* p. 134. 137 (1710); Gronovius, *Zooph.* p. 189. n. 729 (1764) (India); Seba, *Thes.* IV. p. 35. t. 28. f. 23. 24 (1765) ("capensis est" *ex. err.*).

Papilio Eques Trojanus hector Linné, *Syst. Nat.* ed. x. p. 459, n. 2 (1758) (Indiae); Clerck, *Icon. Ins.* II. t. 33. f. 1 (1764); Linné, *Mus. Lud. Ulr.* p. 183. n. 2 (1764); Houtt., *Naturl. Hist.* I. 11. n. 190. n. 2 (1767); Linné, *Syst. Nat.* ed. xii. p. 745. n. 2 (1767); Müll., *Naturs.* V. 1. p. 566. n. 2 (1774); Fabr., *Syst. Ent.* p. 443. n. 4 (1775); Sulz., *Gesch. Ins.* p. 141. t. 12. f. 1 (1776) (India); Cram., *Pap. Ecot.* II. p. 67. t. 141. f. A (1777) (Coromandel; Bengal; "Amboina" *loc. err.*); Goeze, *Ent. Beytr.* III. 1. p. 29. n. 2 (1779); Fabr., *Spec. Ins.* II. p. 2. n. 5 (1781) (*p.p.*); Barbut, *Genera Ins.* Linné p. 161. t. 10. f. 2 (1781); Meusch., *Index Gronov. Zoophyl.* (1781); Esper, *Aust. Schmett.* p. 15. n. 2. t. I. f. 2 (1784) (*synon. ex p.*); Jablonsky, *Naturs. Schmett.* II. p. 137. n. 34. t. 13. f. 2 (1784) (*synon. ex p.*); Fabr., *Man. Ins.* II. p. 1. n. 6 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2225. n. 2 (1790) (*synon. ex p.*); Fabr., *Ent. Syst.* III. I. p. 3. n. 7 (1793); Esper, *Aust. Schmett.* p. 246. t. 40. f. 2 (l.). 3 (*p.*) (1798) (Tranquebar).

Princeps heroicus hector, Hübner, *Samml. Erot. Schmett.* I. t. 110. f. 1. 2 (1806-16).

Menclaudes hector, Hübner, *Verz. bek. Schmett.* p. 84. n. 864 (1816); Moore, *Lep. of Ceylon* I. p. 152. t. 58. f. 2 (1881) (Ceylon: low country); Swinhoe, *P. Z. S.* p. 145. n. 142 (1885) (Poona, Belgaum, Bombay: March to October).

Papilio hector, Godart, *Enc. Méth.* IX. p. 70. n. 124 (1819); Charpent., *Zusätze zu Esper's Aust. Schm.* p. 3 (1830) (Ceylon); Lucas, *Lép. Exot.* p. 8. t. 4. f. 2 (1835) (Bengal: Coromandel; "Amboina" *loc. err.*); Boisd., *Spec. Gén. Lép.* I. p. 269. n. 93 (1836) (Coromandel; Ceylon; "Pegu," Burma, *loc. err.*); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 39 (1840) (*p.p.*); Ceylon; Coromandel; "Amboina" *loc. err.*); Westw., *Arc. Ent.* I. p. 9. t. 3. f. 1-4 (*l., p.*) (1845); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 25 (1846) (N. India; Ceylon; "Pegu" *loc. err.*); Gray, *Cat. Lep. Ins. B. M. I.* p. 11. n. 41 (1852) (India; Ceylon); id., *List Lep. Ins. B. M. I.* p. 13. n. 45 (1856) (Calcutta; N. India; Ceylon); Lucas, in Chenn's *Enc. d'Hist. Nat.* t. 5. f. 1 (1851-53); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 93. n. 189. t. 2. f. 4. 4a. 4b (*l., p.*) (1857) (Calcutta; N. India; Madras; Ceylon); Vollenhov., *Tijdschr. v. Ent.* III. p. 79. n. 77 (1860) (Pondicherry; "Amboina" et "New Holland" *loc. err.*); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 493. & p. 375. n. 290 (1864) (Ceylon; Ind. sept.; "Pegu," "Amboina," "Australia" *loc. err.*); Moore, *P. Z. S.* p. 756 (1865) (Bengal); Koch, *Indo-Austral. Lep. Fauna* p. 63 (1865) (Sud & Nord Indien; Ceylon; "Java," "Amboina," "Australia" *loc. err.*); Alexander, *Ent. Mo. Mag.* p. 208 (1865) (Sangor); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 258 n. 80 (1869) (Madras); Eaton, *Entomol.* p. 276 (1879) (roosting in flocks); Oberth., *Et. d'Ent.* IV. p. 44. n. 61 (1879) ("Inde"; *ab.* with some of the red spots on hindwings obliterated); Aurivill., *Kongl. Sr. Vet. Ak. Handl.* XIX. 5. p. 9. n. 2 (1882); Stauding. & Schatz, *Exot. Schmett.* I. p. 6. t. 3 (♂) (1884); Watson, *Journ. As. Soc. Beng.* p. 268 (1890) (Madras; common, June to September); id., *Journ. Bombay N. H. Soc.* p. 37. n. 116 (1890) (Mysore; common); Betham, *ibid.* p. 330. n. 115 (1891) (Central Provinces); Haase, *Untersuch. üb. Min.* p. 24 (1893).

Papilio (Meneclides) Hector, Nicóville, *Journ. As. Soc. Beng.* p. 52. n. 132 (1885) (Calcutta, rare; Chandernagore, common in November); Hamps., *ibid.* p. 363. n. 198 (1888) (Nilgiri Hills; 1000 to 7000 feet); Fergus., *ibid.* p. 446. n. 178 (1891) (Travancore; very common in the low country and in the lower slopes of the hills).

The range of this species is rather restricted. In Ceylon and Southern India *P. Hector* is very common at low elevations; farther north it becomes rarer, and does not seem to go beyond the 25th degree of N. Lat. Mr. Hampson records it from the Nilgiri Hills as occurring from 1000 up to 7000 feet.

The subapical white macular band on the forewings, which is sometimes reduced to three small spots, is often joined to the discal band by means of white discal linear markings between the upper median and the discoidal veins; in such specimens the white colour is distributed over the wing nearly as in *P. jophon* Gray. The discal band assumes often a reddish tint near the hinder angle. The discal series of spots on the hindwings, though not quite constant as regards the size of the red dots, is seldom incomplete; Mr. Oberthür (*l.c.*) records a variety from "Inde" which has some of the discal spots of the hindwings obliterated.

Hab. Ceylon, S. India, Madras, Central Provinces, Calcutta (20 ♂, 4 ♀).

28. *Papilio jophon* Gray [♂, ♀].

Papilio jophon Gray, *Cat. Lep. Ins. B. M. I.* p. 10. n. 35. t. 4. f. 4 (♀) (1852) (Ceylon); *id.*, *List Lep. Ins. B. M. I.* p. 11. n. 38 (1856) (Ceylon); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 489 (1864) (Ceylon); Haase, *Untersuch. üb. Mim.* p. 24 (1893).

Papilio polyphontes, Oberthür, *Et. d'Ent.* IV. p. 41. n. 58 (1879) ("*jophon* Gray est une ♀ de *polyphontes* un peu plus blanche que la ♀ type"!).

Meneclides jophon, Moore, *Lep. of Ceylon* I. p. 152. t. 58. f. 1 (♀) (1881) (Ceylon).

The forewings of the *male* are narrower than those of the *female*. The first discal white mark of the hindwings situated before the subcostal vein is often obliterated above and below; the submarginal red spots are sometimes small and very narrow. The anal red mark is mostly joined on the upperside to the posterior white discal spot, but stands also very often separate.

Hab. Ceylon (local; rather rare; 5 ♂, 3 ♀).

29. *Papilio pandiyanus* Moore [♂, ♀].

Papilio jophon, Wood-Mason (*nee* Gray, 1852), *Journ. As. Soc. Beng.* p. 86 (1881) (Trevandrum).

Papilio pandiyana Moore, *Tr. Ent. Soc. Lond.* p. 313 (1881) (Travancore).

Papilio (Meneclides) pandiyana, Hampson, *Journ. As. Soc. Beng.* p. 363. n. 197 (1888) (Nilgiri Hills; confined to the western slopes, 1000 to 3000 feet, where it is common).

Papilio (Meneclides) pandiyana, Fergusson, *Journ. Bombay N. H. Soc.* p. 446. n. 179 (1891) (Travancore; abundant in the hills at about 2000 feet, found also in the low country at the foot of the hills).

Though closely allied to *P. jophon* Gray, this species is constantly (as far as we know) different in pattern. The white colour of the forewings is much more extended, especially in the apical region, but also more shaded with black scales; the internervular black streaks between the median nervules are much longer; the white linear markings in the cell reach the discocellular veinlets. On the hindwings the last discal white spot reaches mostly to the submedian nervure; the anterior one is very large in the *male*, small or divided into two spots or obliterated in the *female*; the discoidal cell is in the *male* often almost entirely filled up with white, whereas in the *female* the white colour sometimes extends scarcely beyond the origin of the subcostal nervule.

Hab. S. India (4 ♂, 3 ♀).

30. *Papilio oreon* Doherty [♂, ♀].

♂ ♀. *Papilio (Menclaides) oreon* Doherty, *Journ. As. Soc. Beng.* p. 192. n. 109 (1891) (Sumba).
Papilio godmani Röber, *Tijdschr. v. Ent.* XXXIV. p. 271 (1891) (Alor); id., *l.c.* t. 3. f. 1 (1892).
Papilio oreon, Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 57 (1894) (Sumba).

Combines to a certain extent the characters of *P. pandiyanus* Moore and *liris* Godart. The forewings are much more extended whitish than in *pandiyanus*; below, they have a strong gloss when viewed obliquely, owing especially to the scaling being rather dispersed.

The anterior discal white spot of the underside of the hindwings is exteriorly (and mostly also towards the base) concave, and often extended along the subcostal and costal veins, thus separating from the black border of the wing a black spot which stands at the basal side of the first red submarginal mark; the posterior white mark varies considerably in size; the other white spots are more triangular than in *pandiyanus* and *jophon*, and exteriorly sinuate. Within the red mark at the anal angle below, there is often a black spot in either sex. The tail has, in Röber's specimen, red scales at the vein traversing it which are not present in my Alor specimens.

The upper median and the lower discoidal veins of the hindwings originate closer together than in either *pandiyanus* or *jophon*, the lower discocellular veinlet being very short; the upper discocellular veinlet is shorter than the second one, which is slightly concave; in this respect *P. oreon* agrees with *P. liris* Godart, of which Doherty considers it to be a local form. The shape and pattern of the wings distinguish *oreon*, however, well enough from *liris* for it to be treated as a distinct species, the more as no intergradations are known.

Hab. Sumba; Alor (4 ♂).

31. *Papilio liris* Godart [♂, ♀].

♂ ♀. *Papilio liris* Godart, *Enc. Méth.* IX. p. 72. 132 (1819) (Timor); Boisid., *Spec. Gén. Lép. I.* p. 269. n. 92 (1836) (Timor); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 38. t. 4. f. 3 (♀) (1840) (Timor); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* 1 p. 9 n. 24 (1846) (Timor; "N.W. Australia" *loc. err.*); Gray, *Cat. Lep. Ins. B. M. I.* p. 11. n. 49 (1852) ("N. Australia" *loc. err.*); id., *List Lep. Ins. B. M. I.* p. 13. n. 41 (1856) ("North-West coast of Australia" *loc. err.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 79. n. 76 (1860) (Timor); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 462. & p. 375. n. 289 (1864) (Timor; "Australia sept. occident." *loc. err.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 44. n. 39 (1865) (Timor; "N.W. Austral." *loc. err.*); Röber, *Tijdschr. v. Ent.* XXXIV. p. 272 (1881) ("Timor Laut" *loc. err.*); Haase, *Untersuch. üb. Min.* p. 24 (1893) (Timor; "N.W. Austral." *loc. err.*).

The specimens from "N.W. Australia" in the British Museum, recorded by Doubleday (*l.c.*) and Gray (*l.c.*), agree well with small Timorese individuals and are most probably not from Australia; as the present species has developed into several subspecies on the islands of the Timor and Tenimber group, it is hardly acceptable that the typical *liris* reappears in N.W. Australia.

I divide *liris* into five local races, namely:—

- (a) *P. liris* Godart from Timor;
- (b) *P. liris wetterensis* subsp. nov. from Wetter;
- (c) *P. liris senescens* Röber from Kisser;
- (d) *P. liris pallidus* subsp. nov. from Letti and Moa;
- (e) *P. liris aberrans* Butl. from Temimber and Babber.

The size and shape of the submarginal spots and the shape of the discoidal cell to the hindwings are not constant.

(a): **P. liris** Godart, forma typ. [♂, ♀].

The front of the head and sides of the prothorax are buffish, tinged with red; the abdomen (exclusive of the back and the middle of the underside of each segment) and the submarginal spots to the hindwings are red.

The *female* is somewhat paler than the *male*, especially in the basal region of the forewings.

Hab. Timor (W. Doherty: Oinainisa, November to December 1891; Dili, May 1892) (9 ♂, 7 ♀).

(b): **P. liris wetterensis** subsp. nov. [♂, ♀].

Head and sides of thorax redder than in *liris*; abdomen and submarginal spots to the hindwings as in *liris*, but the submarginal spots are less distinct on the upper-side, being much shaded with black. The pale region of the forewings is as broad as in *liris*, and whiter, being scarcely tinged with buff; the band of the hindwings is much narrower than in *liris*; above, it is strongly shaded with black; below, it bears a red spot at its outer edge behind the costa, and is entirely (♂) or almost entirely (♀) red beyond the lower median nervule.

The basal and marginal region of the wings is rather deeper black than in *liris*, especially in the *female*.

Hab. Wetter (W. Doherty, May 1892) (2 ♂, 1 ♀).

(c): **P. liris senescens** Röber [♂, ♀].

♂ ♀. *Papilio liris* var. *senescens* Röber, *Tijdschr. v. Ent.* XXXIV. p. 272 (1891) (Kisser, nec Letti).

Differs from *T. liris* in the body being buff-colour instead of red, the wings paler brown, and the median band to the hindwings narrower.

This form combines the characters of *liris* and *aberrans*.

Hab. Kisser.

(d): **P. liris pallidus** subsp. nov. [♂, ♀].

Papilio liris var. *senescens* Röber, *l.c.* p. 272 (1891) (*n.p.*; Letti, nec Kisser).

Agrees in the buff-colour of the body and the submarginal spots of the hindwings with *P. liris aberrans* Butl. The wings are of a pale sepia-brown colour; the band of the wings and the spots of the hindwings are much shaded with brown on the upper-side; below, the submarginal spots are also more or less shaded with brown.

The band of the hindwings varies rather in breadth; on the underside, it is brown beyond the lower median vein in some specimens; in others it includes a small black spot near the anal angle; in others again there is also a small black spot behind the costa.

Hab. Letti (W. Doherty, July 1892) (10 ♂, 3 ♀); Moa (2 ♂).

(e): **P. liris aberrans** Butl. [♂, ♀].

♂ ♀. *Papilio aberrans* Butler, *P. Z. S.* p. 369, n. 14 (1883) (Larat).

Papilio liris ab. *aberrans*, Röber, *Tijdschr. v. Ent.* XXXIV. p. 272 (1891) (Timor Laut).

Differs from *liris* especially in having the head, parts of breast and abdomen, and the submarginal spots of the hindwings buff instead of red. The *females* are as brown as the darkest specimens of the preceding subspecies.

Hab. Tenimber (W. Doherty, June to July 1892) (9 ♂, 5 ♀); Babber (W. Doherty July 1892) (1 ♂).

Note.—The area occupied by the species allied to *jophon* is discontinuous, no representatives having been found in the countries lying between the ranges of *pandiyanus* (S.W. India) and *oreon* (Sumba, Alor).—K. J.

32. *Papilio polyphontes* Boisd. [♂, ♀].

Papilio polyphontes Boisduval, *Spec. Gén. Léop.* I. 268, n. 91 (1836) (Celebes); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 39 (♂, unc ♀) (1840); ♀ = *P. polytes theseus* ♀ -f. loc. *timorensis* Feld.; Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9, n. 23 (1846) (*synon. ex p.*); Gray, *Cat. Lep. Ins. B. M. I.* p. 11, n. 39 (1852) (*synon. ex p.*); id., *List Lep. Ins. B. M. I.* p. 12, n. 43 (1856) (*synon. ex p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 79, n. 74 (1860) (*sub synon.*); Feld., *Verh. z. h. Ges. Wien* p. 326, n. 485 (1864) (Celebes); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 43, n. 28 (1865) (Celebes: Batjan; Morty); Hopff., *Stett. Ent. Zeit.* p. 21, n. 20 (1874) (Celebes); Piepers & Snellen, *Tijdschr. v. Ent.* XXI. p. 40, n. 159 (1878) (Saleyer; Bonthain; Balangnipa; Bantimoerong; not rare; “*polyphontes* is perhaps only a large variety of *polydorus*” *ex. err.*); Oberth., *Et. d’Ent.* IV. p. 44, n. 59 (1879) (Celebes; Halmahera; “*jophon* Gray = ♀ *polyphontes* Boisd.”! *ex. err.*); id., *Ann. Mus. Civ. Genova.* XV. p. 472, n. 11 (1880) (Halmahera); Stauding. & Schatz, *Exot. Schmett.* I. p. 6 (1884); Butl., *Ann. Mag. N. H.* (5). XII. p. 197, n. 48 (1884) (Ternate); Holland, *Proc. Boston Soc. N. H.* p. 77, n. 126 (1890) (Celebes); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

Papilio leobates De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 38 (1840) (*p.p.*; ♀ “with prolonged, broad, parallel tails”).

Papilio polydorus, Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 202 (1884) (*p.p.*).

This species is considered by several entomologists [cf. Snellen (*l.c.*), Pagenstecher (*l.c.*)] as a tailed variety of *P. polydorus* L.; the two insects have, however, nothing to do with one another. The fore- and hindwings of *polydorus* and *polyphontes* are differently shaped; the abdominal fold of the *male* is very small in *polyphontes*, rather large in *polydorus*; the *polyphontes* from Ternate and Halmahera have an orange red front of the head, whereas in *polydorus* from the Northern Moluccas the head is entirely black.

The specimens from the Northern Moluccas do not seem to be subspecifically distinguishable from those from Celebes, Sulla Islands, and Talaut, though my specimens show a very slight difference in the colour of the head, the latter being more or less blackish just before the antennae in the Celebes, Sulla, and Talaut individuals, whereas the front of the head is of a uniform reddish colour in the examples from the Northern Moluccas.

(*a*²): ab. *roseus* Oberth.

Papilio polyphontes var. *rosa* Oberthür, *Et. d’Ent.* IV. p. 113, sub n. 59 (1879) (Celebes).

Discal patch of hindwings red instead of white.

This form is known only from Celebes.

Hab. Celebes (11 ♂, 4 ♀); Sulla Islands (Mangola Island: 1 ♂, 1 ♀); Talaut (1 ♂, 3 ♀); Batjan (1 ♀); Ternate (3 ♀); Halmahera (1 ♂, 2 ♀); Morty.

Note.—About the differences in the scaling of the abdominal folds of ♂♂ in *P. polyphontes* and *P. polydorus*, see p. 252, sub n. 39—K. J.

33. *Papilio polydorus* L. [♂, ♀, pupa].

- Seba, *Thes.* IV. p. 35 t. 28. f. 21, 22 (1765) ("Promont. b. sp." *loc. err.*).
- Papilio polydorus* Linné, *Amoen. Acad.* VI. p. 401. n. 50 (1763) ("India"); Clerck, *Icon. Ins.* II. t. 33. f. 2 (1764); Godart, *Enc. Méth.* IX. p. 71. n. 130 (1819) (♀, *nee* ♂); Doubl Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 18 (1846) ("Indian Archipelago"); Gray, *Cat. Lep. Ins. B. M.* I. p. 9. n. 33 (1852) (*sub synonym.*); id., *List Lep. Ins. B. M.* I. p. 10. n. 36 (1852) (*sub synonym.*); Volleuhov., *Tijdschr. v. Ent.* III. p. 63. n. 72 (1860) (Amboina; "Maccassar" *loc. err.* 1); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 483. & p. 375. n. 287 (1861) (Amboina; Ceram; Ternate; *nee* Australia; "Java" *loc. err.*); Koch, *Indo-Austral. Lep. Fauna*, p. 63 (1865) (Ceram; Amboina; *nee* Australia, Celebes; "Java" *loc. err.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 42. n. 24 (1865) (*p.p.*; Ceram; Matabello I.; Batjan; Buru); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 258 (1869) (*p.p.*; *nee* Aru Is.); Oberth., *Et. d'Ent.* IV. p. 44. n. 57 (1879) (Amboina); Aurivill., *Kongl. Sv. Vet. Ak. Handl.* XIX. 5. p. 171. n. 8 (1882); Stauding. & Schatz, *Erot. Schmett.* I. p. 6 (1884); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 202 (1884) (*p.p.*; Amboina); Ribbe, *Iris* II. p. 208. n. 4 (1890) (Ceram; Amboina; *nee* Aru, Papua); Haase, *Untersuch. üb. Min.* p. 25 (1893) (Moluccas; *nee* Australia).
- Papilio Eques Trojanius polydorus* Linné, *Syst. Nat.* ed. xii. p. 746. n. 10 (1767) ("India"); Fabr., *Syst. Ent.* p. 446. n. 14 (1775) ("India"); Goetze, *Ent. Beytr.* III. p. 33. n. 10 (1779) (*excl. Kloeemann's Beytr.*); Fabr., *Spec. Ins.* II. p. 6. n. 20 (1781) (*synon. ex p.*); Esper, *Aust. Schmett.* p. 28. n. 10. t. 5. f. 2 (1785) (Amboina; "Cap," "Bengal," "Coromandel," "Surinam" *loc. err.*); Gmelin, *Syst. Nat.* I. 5. p. 2229. n. 10 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. 1. p. 9. n. 26 (1793) (*p.p.*).
- Papilio Eques Trojanius polydorus* Müller, *Naturs.* V. 1. p. 568. n. 10 (1774).
- Menelaides polydorus*, Hubner, *Verz. bek. Schmett.* p. 84. n. 868 (1816) (*p.p.*); id., *Samml. Erot. Schmett.* II. t. 102. f. 3. 4 (1816-24).
- Papilio polydorus* var., Boisduval, *Spec. Gén. Lép.* I. p. 267. sub n. 90 (1836) (Moluccas).
- Melanides polydorus*, id., *l.c.* (1836).
- Papilio leohotes* De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 38. t. 6. f. 3 (1840) (Moluccas).

The variation of this species according to locality is not very conspicuous, but still important enough to justify a separation of *polydorus* into a number of geographical races, of which that inhabiting the Southern Moluccas is the typical one described by Linné. It has not yet been observed that several of these races have black heads and necks, while others have these parts red; the extent of the red on the abdomen is also different in several subspecies, and so is the size and form of the white spots on the hindwings; such differences are, however, not of specific value, as there exist intergradations of every kind. I distinguish eight subspecies, to which probably will come a ninth, from Woodlark Island: -

- (a): *P. polydorus* L. from the Southern Moluccas;
 (b): *P. polydorus thessalia* Swinh. from the Key and Aru Islands;
 (c): *P. polydorus tenimberensis* subsp. nov. from the Tenimber Islands;
 (d): *P. polydorus queenslandicus* subsp. nov. from Queensland;
 (e): *P. polydorus septentrionalis* subsp. nov. from Halmahera;
 (f): *P. polydorus godartianus* Luc. from Mysol, Salwatty, Waigeu, New Guinea, D'Entrecasteaux Islands;
 (g): *P. polydorus novobritannicus* subsp. nov. from the Bismarck Archipelago;
 (h): *P. polydorus polydaemon* Math. from the Solomon Islands.

In *polydorus*, *thessalia*, *tenimberensis*, and *queenslandicus* the front of the head and the sides of the breast are more or less red; in the other four forms they are black.

(a): **P. polydorus** L., forma typ. [♂, ♀]. ·

The forewings have always a white patch beyond the cell on either side. The hindwings are produced into a rather prominent tooth at the end of the upper median vein; the submarginal red spots are all visible above, though much shaded with

black. The cellular white mark is always rather large, extending behind to the base of the lower median nervule, or almost so far; the first discal spot is much broader than long, and is situated along the second disco-cellular veinlet; the second spot is about as long as broad; the third has a length of about 3 or 4 mm.; the fourth reaches from the median nervule to the end of the third spot; the fifth is as long as the fourth. The nervules separating the spots from one another are black.

Head, sides of sterna, last segments, and ventral edges of all the segments of the abdomen, red.

My Buru specimen (♀) is rather small; the submarginal spots to the hindwings above are rather distinct, and the discal white spots to the same wings are exteriorly somewhat clouded with black.

Hab. Amboina (3 ♂, 4 ♀); Ceram (1 ♂, 1 ♀); Buru (W. Doherty *leg.*: 1 ♀); Batjan (?); Ternate (?).

In the Felderian collection are two specimens of this race from Ternate and Batjan; I doubt the correctness of the locality, but must say that Mr. Philip Crowley's collection contains also red-headed "Batjan" specimens.

(b): **P. polydorus thessalia** (Swinh.) [♂, ♀].

Papilio polydorus local form *a*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 42. sub n. 24 (1865) (Key & Aru Is.).

Papilio polydorus, Oberthür, *Ann. Mus. Civ. Genova* XV. p. 472. n. 10 (1880) (*p.p.*); Ribbe, *Iris* I. p. 78. n. 2 (1886) (Aru Is.); Röber, *Tydschr. v. Ent.* XXXIV. p. 272 (1891) (Key Is.).

Papilio leodamas, Ribbe (*nec* Wallace, 1865), *l.c.* p. 78. n. 3 (1886) (Aru Is.).

♂. *Moneloides thessalia* Swinhoe, *Ann. Mag. N. H.* (6). XII. p. 258 (1893) (Key Is.: "♀" *ex errore, acc. to type-spec.*).

Colonel Swinhoe compares this "species" with *P. polyphontes* Boisd. instead of with *P. polydorus* L., of which it is a geographical race, and which Colonel Swinhoe evidently does not know. The type-specimen, in the British Museum, is a *male*, not a *female*, as Colonel Swinhoe says.

Differs from typical *polydorus* especially in the form of the white patch to the hindwings. The cellular spot is much reduced, often pointlike or even absent from the upperside; the first discal mark is, above, about four times as long (in the direction of the nervules) as broad, or reduced to a point, or absent; the second spot has a length of from 5 to 6 mm.; the third is of the length of the fourth, and reaches therefore farther on the disc than the latter; their length varies from 7 to 9 mm.; the posterior spot is smaller than in *polydorus*, often triangular. The second and third median nervules are mostly red within the white patch.

Hab. Key Islands (1 ♂, 1 ♀); Aru Islands (1 ♂, 1 ♀).

(c): **P. polydorus tenimberensis** subsp. nov. [♂, ♀].

Front of the head red, but the red hairs are so densely mixed with black ones that the head appears to be more black than red.

Upperside deeper black than in *polydorus*.

The white patch on the forewings beyond the cell purer white than in the two preceding subspecies. Hindwings a little shorter than in *polydorus*; the submarginal spots stand, as in *thessalia*, rather closer to the margin than in the typical race. The white patch resembles, in the length of the second, third, and fourth spots, that of *thessalia*. The cellular spot is larger than in *thessalia*, almost as large as in *polydorus*; the first discal mark is of even breadth (2 mm.) and has a length of from

4 to 7 mm.; the three following ones have an average length of 6, 7, and $8\frac{1}{2}$ mm. respectively; the fifth mark is longer than in *polydorus*, as it is basally less obliquely cut off. The nervules are much thinner black than in *polydorus* and *thessalia*; the second and third median ones are reddish.

The posterior submarginal spots are above, as in *thessalia*, less suffused with black than in *polydorus*.

Hab. Tenimber Islands (W. Doherty, June to July 1892) (3 ♂, 5 ♀).

(d): ***P. polydorus queenslandicus*** subsp. nov. [♂, ♀].

Papilio polydorus, Gray (nec Linné, 1763), *Cat. Lep. Ins. B. M. I.* p. 9. n. 33 (1852) (Rockingham Bay); id., *List Lep. Ins. B. M. I.* p. 10. n. 36 (1855) (Rockingham Bay); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 483 (1864) (*p.p.*; Austral.); Koch, *Indo-Austr. Lep. Fauna* p. 63 (1865) (*p.p.*; Austral.); Butl., *Ann. Mag. N. H.* (4). XX. p. 125. n. 25 (1877) (Cape York); id., *P. Z. S.* p. 471 (1877) (Cape York); Semp., *Journ. Mus. Godoffr.* Heft 14. p. 42. 129 (1878) (Cape York); Oberth., *Ann. Mus. Civ. Genora* XV. p. 472. n. 10 (1880) (*p.p.*); Mathew, *Proc. Linn. Soc. N.S. Wales* p. 263 (1885) (Thursday I.).

Papilio leodamas Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 43. n. 25 (1865) (*p.p.*; Rockingham B; acc. to spec. in *Brit. Mus.*).

Comes nearer to typical *polydorus* l. than to *tenimberensis* m. and *thessalia* (Swinh.), and differs from it as follows:—

Size rather smaller; forewings more rounded. Cellular spot to the hindwings as in *polydorus*; the three first discal spots longer, the first also narrower; the two posterior ones as in *polydorus*. Below, there is an additional white mark between the upper discoidal and the subcostal veins, which is sometimes also marked above. The veins bordered with black as in *polydorus*. Head, thorax, and abdomen as in *polydorus*.

In my Thursday Island specimens the white colour on the forewings is rather restricted, and in one individual there is, below, a white transverse spot behind the costa of the hindwings at the basal side of the first submarginal red mark.

From *tenimberensis* m. this subspecies differs especially in the much less extended white and rounder forewings, in the shorter discal spots to the hindwings, of which the first is broader, and in the presence of an additional white discal spot before the first discoidal vein.

From *thessalia* (Swinh.) it is distinguishable by the rounder forewings again, the much larger cellular spot to the hindwings, the larger and differently shaped first discal spot, the shorter second and fourth spots, and larger fifth one.

Hab. Queensland (3 ♂, 3 ♀); Thursday Island (2 ♂).

(e): ***P. polydorus septentrionalis*** subsp. nov. [♂, ♀].

Head and thorax entirely black. Larger than *godartianus*; upperside less deep black, with a much feebler bluish gloss. Forewings longer, with the black internervular stripes more prominent than in typical *godartianus*, the posterior white stripes less marked than in *polydorus* and ab. *plagiatus*, but more than in typical *godartianus*.

The submarginal spots to the hindwings are all visible above; the white cellular spot is about as large as in typical *godartianus*, or a little larger; the discal spots are all rounded exteriorly; the first and last are triangular; the third, fourth, and fifth are shorter than in *godartianus*; in my single ♂ the anterior spots are clouded with black. The nervules separating the spots are heavily black.

Hab. Halmahera (W. Doherty, August 1892) (1 ♂, 3 ♀).

(f): *P. polydorus godartianus* Lucas [♂, ♀].

- Papilio godartianus* Lucas, *Rev. Zool.* p. 129. t. 10. f. 1 (1852) ("Îles de l'Océan-Pacifique" *fig. abt. alieno*); Grose Smith, *Nor. Zool.* p. 334. n. 16 (1894) (Humboldt Bay; Mansinam).
Papilio leodamas Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 43. n. 25. t. 5. f. 2 (1865) (New Guinea; Mysol; *see* Rockingham Bay); Kirsch, *Mitth. Mus. Dresden* I. p. 112. n. 2 (1877) (Ansus); Oberth., *Et. d'Ent.* IV. p. 44. n. 58 (1879) (Amberbaki); *id.*, *Ann. Mus. Civ. Genova* XV. p. 472. n. 12 (1880) (N.W. New Guinea; Salvatty).
Papilio polydorus Godman & Salvin, *P. Z. S.* p. 648 (1878) (New Guinea); Oberth., *Ann. Mus. Civ. Genova* XV. p. 472. n. 10 (1880) (*p.p.*).
Papilio polydorus var. *papuanns* Oberthür, *Et. d'Ent.* IV. p. 44. n. 57 (1879) (N.W. New Guinea).

Though I have about forty-five specimens of *polydorus* from German and Dutch New Guinea, Waigeu, and Salvatty, and some hundreds from the D'Entrecasteaux Islands, now before me, I cannot decide at present whether we have here one or more local races. The typical *godartianus* Lucas, of which *leodamas* Wall. is a synonym, has dark forewings, without a white patch on either side; the white adnervular streaks, though sometimes well marked below, are always narrow, and separated from each other by means of black internervular streaks which run from the outer margin of the wing to the black basal area; the whitish streak behind the lower median nervule on the underside is especially remarkably small. The white patch on the hindwings has the cellular spot small, often smaller than that discal spot which stands before the upper median nervule; the first discal spot is small, longer than broad, often absent; the second mark has a length of about 3 mm., and is mostly of an oblong shape, owing to the upper median and lower discoidal veins being heavily bordered with black. Such specimens are figured by Lucas as *godartianus* and by Wallace as *leodamas*. In many individuals of *godartianus* the cellular and the anterior discal spots on the hindwings are much shaded with black; this slight aberration is, as Oberthür informs us, *papuanns* Oberth.

Typical *godartianus* I know only from the N.W. Peninsula of New Guinea (Arfak, Dorey, Ati-Ati-Onin), and from Mysol and Salvatty.

At Humboldt Bay and all over German New Guinea there occurs a form which is remarkable for some characters: the upperside has a peculiar bluish gloss in certain lights, which is more obvious than in typical *godartianus*; the black internervular streaks on the upperside of the forewings are not strongly pronounced, which gives the wing a peculiar soft appearance; the white streaks in the postcellular region, though often but feebly marked above, are always large below, and form in most specimens a large white patch, which is not interrupted by complete internervular black streaks; in my darkest specimen the white is more extended than in my palest example of *godartianus*. On the hindwings above only the last two submarginal spots are marked or indicated; there is no trace of the other spots, while in most specimens of *godartianus*, in all specimens of *polydorus*, *queenlandicus*, etc., the other submarginal spots are indicated at least by a paler brown scaling. The cellular white mark is very variable, occupying almost half the cell, or being reduced to a small spot; the upper discal spot is large, mostly rhomboidal, often notched, seldom reduced to a small streak; the other spots are also larger than in typical *godartianus*, especially the posterior one; the nervules traversing the white patch are very thinly black.

From Waigeu I have six specimens which agree with the individuals from German New Guinea, except in the black internervular streaks on the upperside of the forewings being more prominent, in the submarginal spots to the hindwings

being all indicated at least by a brown scaling, and in the first discal spot being longer and narrower. In these characters, the Waigeu individuals agree better with the Halmaheran race of *polydorus* than with the above-described New Guinea form. The close relationship of the Waigeu *polydorus* with those from German New Guinea renders it impossible for me to treat the Waigeu and German New Guinea specimens as a subspecies distinct from *godartiannus*, which occupies the interjacent country, and I think that the differences of the forms present themselves to us at present thus, as explained above, because our knowledge of the fauna of those districts is still very insufficient. To draw, however, the attention of the explorers to the present question, I propose to call the form from German New Guinea (type from Stephansort)—

(a²): ab. *plagiatus* ab. nov.

From the island of Fergusson, D'Entrecasteaux group, Mr. A. S. Meek sent a large number of specimens, which are all more or less different from either *plagiatus* or typical *godartiannus*, and agree fairly well with the Waigeu *polydorus*, all of them having a white patch on the forewings, at least on the underside, the first discal white spot of the hindwings elongate (sometimes obliterated), and the submarginal red spots all indicated on the upperside, as in Waigeu specimens. As Mr. A. S. Meek will explore some more of the islands lying east of New Guinea in the course of this year, it is best to treat this Fergusson *polydorus* for the present as *godartiannus* ab. *plagiatus*.

Hab. Salvatty (1 ♀); Mysol; Waigeu (2 ♂, 4 ♀); N.W. Peninsula of New Guinea (8 ♂, 7 ♀); Humboldt Bay and German New Guinea (11 ♂, 14 ♀); Fergusson Island (a long series).

Note.—The Fergusson specimens are somewhat different in scaling from the New Guinea and Waigeu examples; the white scales, for example, between the lower median veins on the underside of the forewings have much longer and sharper teeth than in typical *godartiannus*, ab. *plagiatus*, *polydorus*, etc. In all races, the upper scales are bi-, the under scales tridentate on both sides of the forewings. In some specimens from German New Guinea there appear a few red hairs behind the eyes.—K. J.

(g): ***P. polydorus novobritannicus*** subsp. nov. [♂, ♀, pupa].

Papilio polydorus (?), Godman & Salvin (*loc. cit.* Linné, 1763), *P. Z. S.* p. 149. n. 37 (1877) (Duke of York I.) : *id.*, *loc. cit.* p. 160. n. 46 (1879) (New Ireland).

Head and thorax black, but the front of the head, and the sides of pronotum and of mesosternum, clothed with more or less obvious red hairs, besides the black ones. Abdomen much more extended red than in *godartiannus*.

Forewings: the white stripes well marked, also those in the anterior region of the disc, which in all the other subspecies are rather obscure. The black inter-nervular streaks prominent; that between the lower median veins abbreviated, the following one very short.

The submarginal spots to the hindwings are all visible above; the anterior one, standing behind the costa, is visibly red; the posterior ones are also red, but more shaded with black than in *godartiannus*. The cellular white spot is large, reaching anteriorly at least as far as the origin of the first discoidal nervule; the discal markings are short, but broad, the nervules not being heavily black; the first is more or less trapeze-form, often broader than long, and oblique; its length varies from

2½ to 4 mm.; the next two are much smaller; the fourth is considerably shorter than in the other races, and as broad as in *godartianus*; its average length is about 4 mm.; the fifth is more or less rhomboidal, mostly somewhat longer than broad, shorter than in *godartianus*.

The specimens from New Ireland and Duke of York Island form partly a transition to the next subspecies, as their forewings are darker above than in the New Britain *novobritannicus* m., and the discal spots to the hindwings more rounded.

The pupa closely resembles that of *P. aristolochiae* Fabr.; the abdominal tubercles are rather higher than in that species.

Hab. New Britain (type; 2 ♂, 5 ♀); New Ireland; Duke of York Island (2 ♂).

(h): **P. polydorus polydaemon** Mathew [♂, ♀].

Papilio polydaemon Mathew, *Tr. Ent. Soc. Lond.* p. 48 (1887) (Ugi, Solomon Is.).

Papilio polydemon Mathew, *l.c.* p. 49 (1887) (Treasury I).

I cannot see that the specimens from various parts of the Solomon Islands belong to more than one race. The size and shape of the spots to the hindwings are rather variable in every locality; the nervules separating the white markings are always very broadly black. The posterior black internervular streaks on the underside of the forewings are sometimes complete, extending from the brown border of the wing to the basal brown area.

Hab. Solomon Islands: Ugi; Guadalcanar (4 ♂, 5 ♀); Alu (3 ♂, 4 ♀); Treasury Island. This is the most advanced form of *polydorus*, which I should treat as a species, if it were not for the Duke of York specimens of *P. polydorus novobritannicus* m. and for *P. polydorus septentrionalis* m.

34. **Papilio annae** Feld. [♂, ♀].

Papilio annae Felder, *Wien. Ent. Mon.* V. p. 297. n. 2 (♂, *nee* ♀) (1861) (Mindoro); id., *Verh. z. b. Ges. Wien* p. 326. n. 491 (1864) (Mindoro); id., *Reise Novara, Lep.* I. p. 132. n. 98. t. 20. f. c (♀) (1865) (Mindoro); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 43. n. 29 (1865) (Mindoro).

Papilio (Meneclaidis) annae, Semper, *Philipp., Tagfalt.* p. 271. n. 397. t. 46. f. 2 (♀) (1891) (Mindoro).

(a): **P. annae** Feld., forma typ. [♂, ♀].

The hindwings have, besides a large cellular spot which occupies more than half the cell, six white discal markings, of which the posterior ones are the longest.

The submarginal spots are either all cream-colour, or the three posterior ones are red; above, the submarginal markings are rather obscure, especially in the individuals with a red body: the anal mark is sometimes connected below with the last white discal mark, and is of the same colour as the submarginal spots, *i.e.* either buff or red.

The front of the head, sides of the thorax underneath the wings, and part of the abdomen are either yellowish buff or red.

Hab. Mindoro (A. Everett, December 1894) (4 ♀).

(b): **P. annae phlegon** Feld. [♂, ♀].

♀. *Papilio annae* Felder, *Wien. Ent. Mon.* V. p. 297. n. 2 (♀, *nee* ♂) (1861) ("Mindoro" *loc. err.*).

♀. *Papilio phlegon* Felder, *Verh. z. b. Ges. Wien* p. 326. n. 490 (1864) (Mindanao).

♂ ♀. *Papilio (Meneclaidis) phlegon*, Semper, *Philipp., Tagfalt.* p. 271. n. 398. t. 46. f. 3 (♂) (1891) (S.W. Mindanao; Guimaras).

I know this insect only from the descriptions and Semper's figure; it differs from *annae* in the white markings of the hindwings having a bluish instead of a

faint yellowish tint; the spots round the cell are also a little smaller, and the tails are somewhat shorter. These differences are, however, so slight, that I cannot treat *phlegon* as specifically distinct from *annae*.

Felder described the *female* from "Mindoro"; according to Semper (*l.c.*), in whose collection the *type* is, the specimen came, however, from Mindanao.

Hab. S.W. Mindanao; Guimaras.

35. *Papilio mariae* Semper [σ , ♀].

Papilio mariae Semper, *Verh. Ver. Naturh. Unterh. Hamburg.* III p. 115 (1878): Oberth., *Et. d'Ent.* IV, p. 44, n. 60 (1879) ("Philippines").

Papilio (Meneclides) mariae Semper, *Philipp., Tayfalt.* p. 270, n. 395, t. 46, f. 5 (σ) (1891) (Bohol: Cebu: Mindanao).

Front of the head black. Hindwings with a cellular mark which does not reach beyond the base of the lower median nervule, and with four or five discal spots round the apex of the cell white; abdomen much more restricted red than in the allied species. Since I cannot separate Semper's *P. almae* as a distinct species, we have to enumerate two subspecies:—

(a) *P. mariae* Semper, forma typ. [σ , ♀].

Hindwings with five white spots round the apex of the cell.

The length of the hindwings is somewhat variable; the size of the spots is also inconstant; the anal mark of the hindwings is either small and white, as in Semper's figure of *mariae*, or large and almost as red as in Semper's figure of *almae*.

Hab. Bohol; Cebu; Mindanao (1 σ , 2 ♀).

(b) *P. mariae almae* Semper [σ].

σ . *Papilio (Meneclides) almae* Semper, *Philipp., Tayfalt.* p. 270, n. 396, t. 46, f. 6 (σ) (1891) (Polillo: two specimens!).

Hindwings with four white spots round the apex of the cell, the spot behind the lower median nervule being absent; the basal segments of the abdomen quite black. The anal mark of the hindwings below large and red.

The only difference between this and the preceding form seems to be the absence of a fifth discal spot from the hindwings.

Hab. Polillo.

36. *Papilio phegeus* Hopffer [σ , ♀].

Papilio phegeus Hopffer, *Stett. Ent. Zeit.* p. 32, n. 13 (σ) (1866) ("Luzon" *loc. err.*!).

Papilio (Meneclides) phegeus, Semper, *Philipp., Tayfalt.* p. 270, n. 394, t. 46, f. 4 (σ) (1891) (Samar: Panaon; E. & S.E. Mindanao).

Rather constant. The hindwings have three white discal spots between the lower discoidal and lower median nervules, and a fourth minute one behind the latter vein; besides a small red mark near the anal angle, there are on the upperside three (σ , ♀) or four (♀) red submarginal spots, of which the anterior one is smallest; below, the hindwings have six submarginal spots, the first of which is, however, as in Hopffer's type, often absent.

Hab. Luzon (*loc. err.*?); Samar; Panaon; Mindanao (1 σ , 3 ♀).

37. *Papilio atropos* Stauding. [♂, ♀].

Papilio atropos Staudinger, *Iris* I. p. 276 (1888) (Palawan): id., *l.c.* p. 11 (1889) (Palawan).

The whitish scaling of the forewings is extended to the base, the basal uniformly black area which is present in the allied species being absent. The hindwings have the rounded shape of those of *P. annae* Feld., *i.e.* they are less produced in the post-caudal region than in *P. aristolochiae* Fabr. The tails are long, rather thin and spatulate. The submarginal red spots of the hindwings of the allied forms are absent from *atropos*, though they are very faintly indicated by a scaling which is slightly paler than that of the rest of the wing. The third discocellular veinlet of the hindwings is less oblique than in *P. aristolochiae*; hence the discoidal cell is less pointed at the origin of the upper median nervule than in that species.

Hab. Palawan (2 ♂, 5 ♀).

Note.—The scales of the wings of *P. atropos* Stauding. are different from those of *P. aristolochiae acutus* Druce. On the forewings the scales are more regularly triangular, not being rounded at the sides, and have longer and sharper teeth, especially those on the underside of the wing; on the upperside of the hindwings the upper layer consists of bidentate scales in *P. atropos*, of tridentate ones in *acutus*.

The second median vein of the hindwings is on an average 2 mm. shorter in *atropos* than in *acutus*.—K. J.

38. *Papilio schadenbergi* Semper [♂, ♀].

Papilio (Menelaides) schadenbergi Semper, *Philipp., Tagfalt.* p. 269. n. 393. t. 44. f. 1 (♂); t. 45. f. 5 (♀) (1891) (N.W. Luzon; Babuyan; May, June, and September to November).

(a): *P. schadenbergi* Semper, forma typ. [♂, ♀].

Hindwings shaped as in *aristolochiae* Fabr.; with the submarginal spots rounded and well marked on the upper- and underside, the anterior ones white, the posterior ones red; without discal markings.

Hab. N.W. Luzon and Babuyan (acc. to Semper, *l.c.*) (3 ♂, 2 ♀).

(b): *P. schadenbergi micholitzii* Semper [♂, ♀].

Papilio (Menelaides) schadenbergi var. *micholitzii* Semper, *l.c.* p. 269. sub n. 393. t. 44. f. 2 (♂); t. 45. f. 6 (♀) (1891) (N.E. Luzon).

Differs from the typical form in the spots of the hindwings being all white, or creamy white; the forewings are less white behind the cell.

Hab. N.E. Luzon (acc. to Semper) (1 ♂).

As the dry-season specimens of *P. aristolochiae kotzebueus* Eschsch. are sometimes very similar to the present species, and as further there are no differences between the two insects besides pattern, I believe that *schadenbergi* will turn out to be the northern form of *kotzebueus*; but this is only a supposition.

39. *Papilio aristolochiae* Fabr. [♂, ♀, metam.].

Papilio Eques Trojanus aristolochiae Fabricius, *Syst. Ent.* p. 443. n. 3 (1775) (India); Goeze, *Ent. Beytr.* III. 1. p. 40. n. 4 (1779).

Papilio Eques Trojanus polydorus, Cramer (*acc. polydorus* Linné, 1763), *Pap. Exot.* II. p. 45. t. 128 f. A. B (1777) (*p.p.*; Coromandel, Tranquebar, Bengal; *acc. Amboina*).

Papilio Eques Trojanus polydorus, Goeze, *Ent. Beytr.* III. 1. p. 33. n. 10 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 6. n. 20 (1781) (*p.p.*); Jablonsky, *Naturs. Schmetz.* II. p. 201. n. 43. t. 15. f. 3 (1784); Fabr., *Mont. Ins.* II. p. 3. n. 21 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2229. n. 10 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. 1. p. 9. n. 26 (1793) (*p.p.*).

- Papilio Equus Trojanns hector*, Fabricius, *Spec. Ins.* II. p. 2. n. 5 (1781) (*p.p.*); Jablonsky, *Naturschm.* II. p. 201. n. 43 (1784) (*sub synonym.*); Esper, *Ausl. Schm.* p. 15. n. 2 (1784) (*sub synonym.*); Gmelin, *Syst. Nat.* I. 5. p. 2226. n. 273 (1790) (*sub synonym.*).
- Papilio Equus Trojanns diphilus* Esper, *Ausl. Schm.* p. 156. n. 73. t. 40. f. 2 (1792) (Tranquebar).
- Princeps heroicus polydorus*, Hübner, *Samml. Exot. Schm.* I. t. 111 (1806-16).
- Menelaides polydorus*, Hübner, *Verh. Verh. Nat. Gesch. Nid. oerz. bez.* p. 84. n. 868 (1816) (*p.p.*).
- Papilio polydorus*, Godart, *Enc. Méth.* IX. p. 71. n. 130 (1819) (*p.p.*: Bengal, Coromandel, Java; *nee* Amboina); Horsf., *Cat. Lep. Ins. Mus. E. I. C. I.* t. 3. f. 17 (larva) (1828) (Java); Boisd., *Spec. Gén. Lép.* I. p. 267. n. 90 (1836) (*p.p.*: Java, Borneo, Bengal, Ceylon; *nee* Amboina); De Haan, *Verh. Nat. Gesch. Nid. oerz. bez.* p. 38. t. 8. f. 1 (1840) ("Moluccas" *loc. err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 18 (1846) (*sub synonym.*); Wallengren, *Wien. Ent. Mem.* VII. p. 65. n. 4 (1863) (Java; February).
- Papilio adamas* Zinken, *Nova Act. Ac. Nat. Cur.* XV. p. 144. n. 3 (1831) (Java).
- Polydorus thoas* Swainson, *Zool. Illustr.* (2) II. t. 100 (*♂, ♀, p.*) (1833) (Java).
- Papilio diphilus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 10. n. 34 (1852) (India; Ceylon; Java); *id.*, *List Lep. Ins. B. M.* I. p. 11. n. 37 (1856) (Java; N. China; N. India; Ceylon); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 94. n. 190. t. 2. f. 5 (*l.*). 5a (*p.*) (1857) (Java; Calcutta; N. India); Vollenhov., *Tijdschr. v. Ent.* III. p. 79. n. 73 (1860) (Java; "Moluccas" *loc. err.*); Feld., *Verh. z. h. Ges. Wien* p. 326. n. 486 (1864) (China austral.; Siam; India sept.; Ceylon; Java; "Luzon" *loc. err.*); Lang, *Ent. Mo. Mag.* p. 101 (1864) (N.W. Himal.); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 43. n. 26 (1865) (Java; Malacca; India; *nee* Philippine Is.); Moore, *P. Z. S.* p. 756 (1865) (Bengal); Chaum., *Ent. Mo. Mag.* p. 37 (1865) (Sangor); Alex., *ibid.* p. 208 (1865) (Sangor); Moore & Wall., *P. Z. S.* p. 356 (1866) (Formosa); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 258. sub n. 78 (1869); Druce, *P. Z. S.* p. 109. n. 8 (1874) (Siam); Pryer, *Ent. Mo. Mag.* p. 52 (1877); Butl., *Tr. Linn. Soc. Lond.* (2). *Zool.* II. p. 553. n. 21 (1877) (Malacca); Butl., *P. Z. S.* p. 153. n. 31 (1883) (N.W. India).
- Papilio aristolochiae*, Butler, *Cat. Diurn. Lep. descr. Fabric.* p. 258. n. 78 (1869) (Ceylon); Holland, *Tr. Amer. Ent. Soc.* p. 123. n. 77 (1878) (Hainan); Moore, *P. Z. S.* p. 840 (1878) (Upp. Tenasserim; *aristolochiae* Fabr. = *diphilus* Esp.); Oberth., *Et. d'Ent.* IV. p. 43. n. 56 (1879) (India; China; *aristolochiae* Fabr. = *diphilus* Esp. = *polydorus* Cram. [*nee* Linné], Hübner, Boisd.): Nicéev., *Journ. As. Soc. Beng.* p. 53 (1881) (Sikkim; October); Elwes, *P. Z. S.* p. 872 (1881) (Ningpo); Butl., *Ann. Mag. N. H.* (5). XVIII. p. 189. n. 48 (1886) (Upp. Burma); Elwes, *Tr. Ent. Soc. Lond.* p. 427. n. 403 (1888) (Sikkim; common up to 2000 or 3000 feet from April to December; *P. aristolochiae* "Cram." *ex err.*); Lecch, *ibid.* p. 114. n. 64 (1889) (Kiu Kiang); Manders, *ibid.* p. 535. n. 188 (1890) (Shan States; very common, but not found. I think, above 5000 feet); Pagenst., *Jahrb. Nass. Ver. Nat.* p. 99. n. 138 (1890) (E. Java); Davids & Aitk., *Journ. Bomb. N. H. Soc.* p. 362 (1890) (Canara; *l., p.*); Watson, *Journ. As. Soc. Beng.* p. 268 (1890) (Madras); *id.*, *Journ. Bombay N. H. Soc.* p. 53 (1891); Rothsch., *Iris* V. p. 442 (1892) (Celebes); Robbe, *Ann. Soc. Ent. Belg.* p. 124. n. 4 (1892) (Kurseong); Lecch, *Butterfl. of China* etc. p. 554 (1893) (China); Oberth., *Et. d'Ent.* XVII. p. 3 (1893) (Tonkin).
- Papilio mariae* var., Oberthür., *Et. d'Ent.* XI. p. 14 (1886) (W. China; *haec spec., teste Oberth. in litt.*).
- Menelaides aristolochiae*, Moore, *P. Z. S.* p. 259 (1882) (N.W. Himal.).
- Papilio (Menelaides) diphilus*, Swinhoe, *P. Z. S.* p. 512. n. 59 (1884) (Kurrachee).
- Papilio (Menelaides) aristolochiae*, Nicéville, *Journ. As. Soc. Beng.* p. 52. n. 131 (1885) (Calcutta; very common; strongly smelling, hence called "Rose Butterfly"); Doherty, *ibid.* p. 137. n. 230 (1886) (Kumaon); Wood-Mas. & Nicéev., *ibid.* p. 376. n. 190 (1886) (Cachar); Elwes & Nicéev., *ibid.* p. 435. n. 130 (1886) (Tavoy; Pongseki); Hamps., *ibid.* p. 363. n. 199 (1888) (Nilgiri Hills; 1000 to 7000 feet); Ferguson, *Journ. Bombay N. H. Soc.* p. 446 (1891) (Travancore); Nicéev., *Gazetteer of Sikkim* p. 171. n. 470 (1894) (Sikkim; common in lower valleys).
- Papilio aristolochiae* var. *diphilus*, Distant, *Ithop. Mol.* p. 337. n. 5. t. 31. f. 6. 7 (1885) (Mal. Pen.).
- Menelaides diphilus*, Swinhoe, *P. Z. S.* p. 145. n. 141 (1885) (Bombay and Deccan; common everywhere from October till June); *id.*, *l.c.* p. 433. n. 97 (1886) (Mhow); Moore, *Journ. Linn. Soc. Lond.* p. 51 (1889) (Mergui).
- Menelaides aristolochiae* (*sic!*), Swinhoe, *Tr. Ent. Soc. Lond.* p. 313. n. 386 (1893) (Khasia Hills).

The name of *aristolochiae* given to this insect by Fabricius in 1775 entirely disappeared after 1781, when Fabricius curiously confounded his species with *hector* L., till Mr. Butler (*l.c.*) re-established the name in 1869. Cramer, and after him Godart,

Boisduval, De Haan, etc., mistook this species for the Linnæan *P. polydorus*, while Esper, recognising Cramer's mistake, and being misled by Fabricius's *Spec. Ins.*, where *aristolochiæ* stands as a synonym of *hector*, described and figured it under a new name, *P. diphilus* Esper. This name again disappeared till 1852, when Gray applied it to the present insect. Zinken (*l.c.*), not being aware that *aristolochiæ* was a published name and not a manuscript name of Fabricius, described the *Papilio* from Fabricius's manuscript of "Syst. Gloss. ined." as new, under the name of *adamus*.

Fabricius gives as locality only "*India orientalis*"; Esper's *diphilus* came from Tranquebar, and Zinken's *adamus* from Java. Now the *aristolochiæ* from Java, Malacca, Burma, Continental India, Ceylon, and China cannot, in my opinion, be separated into local forms, though a good number of specimens from some of these localities exhibit characters which are local, so that one can indeed in many cases tell the locality from the peculiar characters of a specimen; but as only a relatively small percentage of individuals show the local characters, we have no subspecies, but local aberrations which have not yet developed into subspecies.

Several modern authors have treated *aristolochiæ* and *diphilus* as distinct species, or at least as two representative forms of a species. Mr. Butler, in his *Cat. Diurn. Lep. descr. by Fabricius*, p. 258, says of *aristolochiæ*: "This is the Ceylonese representative of *P. diphilus* Esp.," and gives as synonym Gray's var. c [*Cat. Lep. Ins. B. M. I.* p. 10. n. 34 (1852)], which has a white spot in the apex of the discoidal cell to the hindwings. Fabricius describes the hindwings thus: "*Fascia maculari alba lunulisque rubris*"; the "white macular band" fits, however, certainly better to the specimens without the cellular spot than to those with that additional spot, especially to Javan individuals with a row of four or five white markings. This question is of some importance, as Moore's *ceylonicus*, which is an aberration, not a local race, is based on specimens with the cellular spot. Esper's *diphilus* has three white spots situate between the lower median and lower discoidal veins; the second one is the longest. Such specimens which agree with Esper's figure occur not only in Tranquebar, but also in Ceylon and all over Continental India, Burma, Siam, Malacca, and China, and fly together with specimens which have more white markings. *P. diphilus* is, therefore, not a local race of *aristolochiæ*, but one of the numerous widespread individual aberrations, and will be best regarded as a mere synonym of *aristolochiæ* Fabr., as it certainly is quite inopportune to have a number of aberrational names for the specimens with a series of two, three, four, or five discal spots to the hindwings; the individuals with the additional cellular spot can, however, be kept separate as ab. *ceylonicus* (Moore). As I have, therefore, to treat *aristolochiæ*, *diphilus*, and *adamus* as belonging to one geographical race, there remain seven subspecies of the species in question, namely:—

- (a): *P. aristolochiæ* Fabr. from Ceylon, Continental India, Burma, Malacca, Siam, China, Loo Choo Islands, Natuna Islands, Java, Celebes;
- (b): *P. aristolochiæ austrosundanus* subsp. nov. from Sambawa;
- (c): *P. aristolochiæ camorta* Moore from the Nicobar Islands;
- (d): *P. aristolochiæ philippus* Stauding. from the South-Eastern Islands of the Philippine group;
- (e): *P. aristolochiæ kotzebueus* Eschsch. from the Northern and Western Philippines and the Sulu Islands;
- (f): *P. aristolochiæ acutus* Druce from North Borneo and Palawan;
- (g): *P. aristolochiæ antiphus* Fabr. from Sumatra, Nias, Java, Lombok, Natuna Islands, and Borneo.

The reasons which induce me to regard *antiphus*, *acutus*, and *kotzebueus* as geographical races of *aristolochiæ* are as follows:—

(1) The caterpillars of *aristolochiæ* and *antiphus*, as described and figured by Moore and Hagen respectively, do not differ from one another. Dewitz's figure of the larva of *kotzebueus* (see below) is incorrect; the whitish band and spines ought to stand upon that segment which bears the first pair of ventral legs, instead of upon the preceding segment; this mistake is excusable, as Dewitz's figures were partly taken from drawings of the collectors.

(2) There occur individuals of the butterflies intermediate in colour between *aristolochiæ* and *antiphus*, and between *philippus* and *kotzebueus*.

(3) The sexual organs of the *males* are the same.

(4) The position, form, and sealing of the submarginal spots of the hindwings are the same in *aristolochiæ* and *antiphus*.

P. aristolochiæ and *antiphus* occur together in Java and on the island of Bunguran (Natuna Islands); in the first locality *antiphus* is, however, very scarce, while on Bunguran *aristolochiæ* is rare, out of 150 specimens received from Bunguran only two belonging to this form; from Borneo, Sumatra, Palawan, and the Sula Islands *aristolochiæ* has not been recorded.

(*a*): **P. aristolochiæ** Fabr., forma typ. [*♂*, ♀, metam.].

This race is especially variable in the extent of the black basal region of the underside of the forewings, and in the number and position of the white spots on the hindwings. The submarginal spots to the hindwings are sometimes rather small.

In the North Indian individuals the black basal area of the underside of the hindwings reaches mostly somewhat beyond the origin of the lower median nervule, often even beyond the base of the second median vein, and extends much farther along the subcostal than along the median nervure; the white-coloured apical portion of the cell is often reduced to three small spots. The number of white spots on the hindwings varies from three to four; that behind the lower median vein is in many examples also almost white and seldom includes a black spot. The discal spots become often reduced in size; as the reduction of each spot takes place from the basal side, the remaining parts of the spots stand very often far from the cell, in many individuals midway between the cell and the submarginal markings; this latter character appears very seldom in specimens from other localities.

The Ceylonese specimens agree with the North Indian ones; but the white colour of the underside of the forewings is often more extended, and a greater number of individuals have a white cellular spot to the hindwings, which character misled Moore to treat the Ceylon specimens as belonging to a distinct species (*Meneloides ceylonicus* Moore). The spot at the anal angle includes mostly a black mark, or is emarginate at the lower median vein.

Most of my Burmese examples, and those from the Shan States, are remarkable for the length of the white markings; the spot between the first and second median branches is the longest, and usually of the same peculiar form as in *P. aristolochiæ philippus*. The anal reddish mark includes, as in the Ceylonese examples, a black spot, or is sinuate. The basal black area of the forewings as in the North Indian specimens. The individuals from the Shan States have often a white cellular spot to the hindwings.

The Malaccan individuals have the black region of the underside of the forewings often reduced; the white spots of the hindwings stand (always?) close to the cell; the spot before the upper median nervule is mostly the longest; the spots are more

rounded exteriorly than in most Burmese specimens: the anal mark as in the latter; a cellular spot is often present.

The two Bunguran specimens (♂ ♂) have three white discal markings, of which the middle one is the longest; in one individual there is, besides, a minute white pointlike spot before the second discoidal vein; the tails of both specimens are short and narrow, and in one the tails are not dilated towards the apex, thus reminding one strongly of *P. aristolochiae acutus* Druce.

On the island of Engano Doherty obtained one specimen of *aristolochiae* which agrees well with Javan examples, but has the anal spot not sinuate.

In the Javan specimens the black area of the underside of the forewings is mostly much reduced, more than the apical half of the cell being whitish (exclusive of four black folds); the white spots on the hindwings stand (always?) close to the cell; all my specimens have four white spots besides the anal mark, which latter is deeply sinuate; there is never (?) a spot within the cell. The front of the head just before the antennae is rather black.

The *females* of the Chinese *aristolochiae* are rather pale. In both sexes the black basal region of the underside of the forewings is somewhat less extended than in North Indian examples. The white spots vary in number from two to four; they are usually small, and stand close to the cell; the spot before the upper median nervule is mostly the longest; there is no spot within the cell; the anal mark is always deeply sinuate, sometimes obliterated above. The front of the head is mostly darker than in Indian examples, especially in the *females*.

My two Loo Choo specimens have the anal mark of the hindwings small and non-sinuate; both have four discal spots, which are tinged with red, especially below; the anterior spot is small, but well marked, and stands closer to the submarginal spot than to the cell; the second and third spots are rather long.

(*a*²): ab. *ceylonicus* (Moore).

Papilio diphilus var. c, Gray, *Cat. Lep. Ins. B. M.* 1, p. 10. sub n. 34 (1852) (Ceylon).

Menelaides ceylonicus Moore, *Lep. of Ceylon* I. p. 151. t. 57. f. 2 (1881) (Ceylon).

Hindwings with a white spot within the apex of the cell.

This aberration is in my collection from Ceylon, Burma, the Shan States, and Malacca; it occurs also in N. India, but not in China and Java, as far as I know.

From Burma I have several examples of *aristolochiae* in which the red colour of the abdomen is very much extended.

Hab. Ceylon (6 ♂, 3 ♀); S. India; N.W. India; Sikkim (9 ♂, 7 ♀); Assam (4 ♂, 4 ♀); Burma (2 ♂, 2 ♀); Shan States and Siam (14 ♂, 5 ♀); Malacca (2 ♂, 2 ♀); Java (4 ♂, 5 ♀); Engano (1 ♂); Bunguran, Natuna Islands (2 ♂); Tonkin; China (13 ♂, 9 ♀); Loo Choo Islands (2 ♂); Celebes.

(*b*): ***P. aristolochiae austrosundanus*** subsp. nov. [♂, ♀].

Papilio aristolochiae, Doherty (*nec* Fabricius, 1775), *Journ. As. Soc. Beng.* p. 192 (1891) (Sambawa: "normal" or *err.*).

The *female* is scarcely of a paler ground-colour than the *male*. In both sexes the black border to the forewings beneath is rather broader than in *aristolochiae*; the internervular black streaks are also broad; the basal black area is of almost the same form as in the Javan *aristolochiae*, but often a little more extended. On the hindwings there are three white discal spots of small size; that between the upper median branches is the longest, and about twice (or less) as long as broad; the spots

become reduced especially from the exterior side, and hence remain rather close to the cell; the anterior one is sometimes very small. The reddish mark near the anal angle includes a black spot, which is situated close to the lower median nervule. The submarginal spots assume in most specimens a lunate shape; in one *female* the two posterior ones are rather arched and touch each other, and the last one is also connected with the anal mark, which is prolonged along the third median vein. The front of the head has seldom a few black hairs.

In general appearance this form resembles certain Chinese specimens of *aristolochiae* Fabr., but can be distinguished by the much darker *female* and by the presence of only three small white spots on the hindwings, of which the middle one (not that before the upper median vein) is the longest. From three-spotted Indian and Ceylonese *aristolochiae* it is distinguishable especially by the position of the white spots.

Hab. Sambawa (W. Doherty, September 1891) (12 ♂, 3 ♀).

(c): **P. aristolochiae camorta** Moore [♂, ♀].

Papilio aristolochiae var. *camorta* Moore, *P. Z. S.* p. 592 (♀) (1877) (Kamorta): Wood-Mas. & Nicéy., *Journ. As. Soc. Beng.* p. 237. n. 56 (1881) (Nicobar Is.); *id.*, *l.c.* p. 18. n. 60 (1882) (Nicobar Is.).

The white spots of the hindwings small, only that between the lower median veins is clearly marked on the upperside; the two others, standing before and behind the upper median nervule, are sometimes entirely absent from the upperside, or, when present, are much suffused with black; below, there is usually a spot within the apex of the cell.

Hab. Nicobar Islands (3 ♂, 1 ♀). Not recorded from the Andamans, but Staudinger informs me that he received Andaman specimens from the late Mr. Roepstorff.

(d): **P. aristolochiae philippus** Semper [♂, ♀].

Papilio (Meneclides) aristolochiae var. *philippus* Semper, *Philipp.*, *Tayfalt.* p. 269. n. 392. t. 44. f. 7. 8. 9 (♂); t. 45. f. 3. 4 (♀); t. 46. f. 1 (♂-ab.) (1891) (Leyte, Panaon, Siargao, Camiguin, Mindanao).

The tails are broader than in *aristolochiae*, a character which *philippus* has in common with the other Philippine subspecies of *aristolochiae*, namely *kotzebeus*. The hindwings have from three to five white discal spots, which stand close to the cell; the spot between the two upper median branches is the longest and at the apex triangularly pointed; the nervules separating the spots are thinly black or red. The submarginal markings are mostly purer red on the upperside than in typical *aristolochiae*. There is never a spot within the cell.

Hab. S.E. Islands of the Philippines (8 ♂, 5 ♀).

(e): **P. aristolochiae kotzebeus** Eschsch. [♂, ♀, larv., pupa].

Papilio kotzebeus Eschschaltz., *Kotzebeus's Reise* III. p. 202. t. 1. f. 2a. 2b (♀) (1821) (Manila); *Feld.*, *Verh. z. b. Ges. Wien* p. 325. n. 488 (1864) (Luzon).

Papilio polygynus Godart, *Enc. Méth.* IX. Suppl. p. 811 (1823) (Philippines).

Papilio antiphilus, Boisduval, *Spec. Gén. Lep.* I. p. 266. n. 89 (1836) (Philippines); Thon., *Naturg. Schmitt.* p. 19. t. 7. f. 35. 36 (1837) (Manila); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 21 (1846) (*p.p.*: Philippines; *nee* Java, Bornco); Gray, *Cat. Lep. Ins. B. M.* I. p. 11. n. 37 (1852) (*sub synonym.*); *id.*, *List Lep. Ins. B. M.* I. p. 12. n. 41 (1856) (*sub synonym.*); Reak., *Proc. Ent. Soc. Phil.* p. 456. n. 5 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 43. n. 27 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 43. n. 55 (1879) (Philippines).

- Papilio antiphus* var., Gray, *Cat. Lep. Ins. B. M. I.* p. 11, sub n. 37 (1852) (Manila); id., *List Lep. Ins. B. M. I.* p. 12, sub n. 41 (1856) (Philippines).
Papilio antiphus var. *kotzebuea*, Dewitz, *Nova Act. Ac. Nat. Cur. XLIV.* 2, p. 264, t. 2, f. 3, 3a, 3b (l., p.) (1882) (*larva false signata*).
Papilio (Meneclaidēs) antiphus, Semper, *Philipp., Tagfalt.* p. 267, n. 381, t. 44, f. 3, 4 (♂), 5 (♀); t. 45, f. 1, 2 (♀) (1891) (Luzon; Polillo; Mindoro; Bohol; Cebu; Sulu Is.).

Tails broader than in *antiphus* Fabr.; hindwings below mostly with a bandlike patch near the anal angle consisting of 2, 3, 4, or 5 spots, which are mostly red, but sometimes white, and appear occasionally—according to Semper in the specimens of the dry season—also on the upperside. The submarginal red spots are also well marked on the upperside in certain individuals, which thence become rather similar to *P. schudenbergi* Semp. The underside of the forewings is less extended white than in *antiphus*, the white colour being almost restricted to the postcellular part of the wing.

In the individuals from the Sulu Islands the tails are as broad as in the Philippine specimens, but the bandlike patch on the hindwings beneath is reduced to one spot, which is sometimes partly whitish.

Hab. Northern and Western Philippines (25 ♂, 15 ♀); Sulu Islands (1 ♂).

(f): **P. aristolochiae acutus** Druce [♂, ♀].

- Papilio antiphus* var. b, Gray, *Cat. Lep. Ins. B. M. I.* p. 11, sub n. 37 (1852) (Borneo); id., *List Lep. Ins. B. M. I.* p. 12, sub n. 41 (1856) (Borneo).
Papilio acuta Druce, *P. Z. S.* p. 358 (1873) (N. Borneo).
Papilio antiphus var. *acuta*, Oberthur, *Et. d'Ent.* IV, p. 113, n. 55 (1879) (Labuan); *Stauding., Iris* II, p. 10 (1889) (Palawan).
Papilio (Meneclaidēs) antiphus var. *acuta*, Semper, *Philipp., Tagfalt.* p. 268, sub n. 391 (1891) (Palawan).

Tails not spatulate, being of even breadth or pointed; they are variable in length. Hindwings below with a small red anal spot, not with a bandlike patch as in *kotzebueus*.

(b²): ab. *periphus* Oberth.

- Papilio antiphus* var. *periphus* Oberthür, *Et. d'Ent.* IV, p. 43, sub n. 55, & p. 113, sub n. 55 (1879) (Borneo).

Papilio antiphus var. *acuta* ab. *brevicauda* Staudinger, *Iris* II, p. 10 (1889) (Palawan).

Tail reduced to a tooth.

Hab. North Borneo (1 ♂); Palawan (8 ♂, 6 ♀).

(g): **P. aristolochiae antiphus** Fabr. [♂, ♀, larva, pupa].

- Papilio Eques Trajanus antiphus* Fabricius, *Ent. Syst.* III, 1, p. 10, n. 28 (1793) (India).
Papilio antiphus, Donovan, *Ins. of India* t. 15, f. 2 (1800); Godart, *Enc. Méth.* IX, p. 71, n. 129 (1819); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 49, t. 8, f. 2 (♀) (1840) (Borneo; Sumatra); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 9, n. 21 (1844) (Java; Borneo; nec Philippines); Gray, *Cat. Lep. Ins. B. M. I.* p. 11, n. 37 (1852); (*p.p.*: Java); id., *List Lep. Ins. B. M. I.* p. 12, n. 41 (1856) (*p.p.*: Java; Sumatra); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 94, n. 191 (1857) (*p.p.*: Java); Vollenh., *Tijdschr. v. Ent.* III, p. 78, n. 71 (1860) (Borneo; Sumatra); Feld., *Verh. z. b. Ges. Wien* p. 326, n. 487 (1864) (Java; Sumatra; Lombok); Reak., *Proc. Ent. Soc. Phil.* p. 455, n. 5 (1864) (*p.p.*: Wall., *Tr. Linn. Soc. Lond.* XXV, p. 43, n. 27 (1865) (Sumatra; Borneo; Java; Lombok; nec Philippine Is.); Kheil, *Rhop. Nias* p. 36, n. 137 (1884) (Nias); Stauding. & Schatz, *Exot. Schmett.* I, p. 6 (1884); Dist. & Pryer, *Ann. Mag. N. H.* (5), XIX, p. 273, n. 175 (1887) (Sandakan); Hagen, *Iris* VII, p. 20, n. 12, t. 1, f. 1 (1) (1891) (Sumatra).
Papilio theseus, Butler, *Cat. Diurn. Lep. descr. Fabric.* p. 258, n. 79 (♂, nec ♀) (1869).

The hindwings are somewhat deeper indented than in *acutus*; the tails are mostly spatulate, but sometimes they are rather short and of even breadth: such specimens, which occur in Sumatra and on Bunguran, are not distinguishable from *acutus* Druce. The submarginal spots of the hindwings are feebly indicated above, except the posterior one, which is, like a spot at the anal angle, nearly always well marked; the spots are variable in size and sometimes partly obliterated.

My Lombok specimen, captured by Wallace, is of small size, but does not differ from certain Bornean and Sumatran individuals.

Some specimens from Bunguran (Natuna Islands) have white scales between the upper median nervules of the hindwings close to the discoidal cell, and form a transition to *P. aristolochiæ* Fabr.

P. thesæus of Cramer, which Mr. Butler (*l.c.*) believed to be the female of *antiphæus* Fabr., is a form of *P. polytes* L.

Hab. Sumatra (23 ♂, 6 ♀); Nias; Java; Lombok (1 ♂); Bunguran and Sirhassen, Natuna Islands (about 150 specimens); Borneo (10 ♂, 3 ♀); Banguay Island (2 ♂).

In Northern Borneo the specimens belong partly to this, partly to the preceding subspecies.

The geographical distribution of the forms of *P. aristolochiæ* Fabr. is very remarkable; the range of the white-spotted races is interrupted by that of the black subspecies, and what is still more important to note is the discontinuity of the range of the typical race of *P. aristolochiæ*.

Note.—The species of the *hector*-group can be separated in two sections as follows:—

I. *Males* with the abdominal margin of the hindwings turned upwards and forming a more or less distinct abdominal fold, which is smallest in *P. polyphontes* Boisd., rather large in *P. phegeus* Hopff., *mariae* Semp., *polydorus* L. The scaling within the fold assumes a pale colour; some of the scales become rather narrow, almost hairlike. In *P. polyphontes* Boisd. the scales are much less different in shape and colour from the scales on the disc than in *P. polydorus* L., *aristolochiæ* Fabr., *phegeus* Hopff., etc.; in these latter species they become longer and narrower, and are liable to lose the teeth; they represent, in fact, a rudimentary scent-organ.

II. *Males* with the abdominal margin of the hindwings simply turned downwards as in the other sex. The scaling in the neighbourhood of the submedian nervure is scarcely different from that on the disc. In this section belong *P. hector* L., *jophon* Gray, *pandigianus* Moore, *oreon* Doherty, *liris* Godart. Haase [*Untersuch. üb. Mim.* p. 25 (1893)] refers *P. jophon* Gray to the first section with rudimentary scent-organ, but is wrong in doing so.—K. J.

II. COON-GROUP.

Anal valves of the *male* developed, but there is an open interspace between them dorsally. Legs similar to those of the preceding group.

40. *Papilio coon* Fabr. [♂, ♀].

Papilio Equus Trojanius coon Fabricius, *Ent. Syst.* III. 1. p. 10. n. 27 (1793) ("China" *loc. err.*).

Papilio coon, Donovan, *Ins. of China* t. 24. f. 1 (1798); Godart, *Enc. Méth.* IX. p. 65. n. 109 (1819) ("China" *loc. err.*); Zinken, *Noëa Act. Ac. Nat. Cuv.* p. 146. n. 4. t. 14. f. 3 (1832) (Java); Lucas, *Lep. Exot.* p. 11. t. 6. f. 2 (1835) (Java; "Coromandel" *loc. err.*); Boisd., *Spec. Gén. Lép.* I. p. 291. n. 14 (1836) (Java); Blanch., *Hist. Nat. Ins.* III. p. 421. t. 2. f. t. (1840) ("Indes orientales"); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 41 (1846) (Java;

nee Burmah); Lucas, in Cheny's *Enc. d'Hist. Nat.*, *Pap.* t. 14 f. 1 (1851-53); Gray, *Cat. Lep. Ins. B. M. I.* p. 16. n. 60 (1852) (Java; "India" *loc. err.*); id., *List Lep. Ins. B. M. I.* p. 19 n. 64 (1856) (Java; "India" *loc. err.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 95. n. 192 (1857) (Java; "N India," "China" *loc. err.*); Vollenhov., *Tijdschr. v. Ent.* 111 p. 73. n. 20 (1860) (Java; "Borneo" *loc. err.*); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 428. & p. 374. n. 286 (1864) (Java; *nee* Moulmein; "Borneo" *loc. err.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 42. n. 23 (1865) (Java; Sumatra; "Borneo (De Haan)" *loc. err.*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 257. n. 76 (1869) (Java); Oberth., *El. d'Ent.* IV. p. 45. n. 65 (1879) (Java); Stauding. & Schatz, *Exot. Schmett.* 1. p. 6 (1884) (Java); Haase, *Untersuch. üb. Min.* p. 26 (1893) (Java; "Borneo," "Birma" *loc. err.*); Hagen, *Iris* VII. p. 17 (1894) (Padang, in coll. Staudinger).

Papilio hypenor Godart, *Enc. Méth.* IX. p. 65. n. 108 (1819) (Java).

Achillides hypenor, Hübn., *Samml. Exot. Schmett.* III. t. 23. f. 1. 2 (1834-41).

Very constant. The anterior spot of the submarginal series on the hindwings is sometimes absent from the upperside; the small discal spot standing before the upper median vein is seldom marked above. The yellow mark at the end of the second median nervule is, in one of my specimens, connected below with the corresponding submarginal spot.

Hab. Java (9 ♂, 2 ♀); Sumatra (*teste* Wallace, and in coll. Staudinger).

41. *Papilio doubledayi* Wall. [♂, ♀].

Papilio coon var., Gray, *Cat. Lep. Ins. B. M. I.* p. 16. sub n. 60 (1852) (Moulmein); id., *List Lep. Ins. B. M. I.* p. 19. sub. n. 64 (1856) (Moulmein; "Assam" *loc. err. aut subsp. alt.?*); Feld., *Verh. z. b. Ges. Wien* p. 326. sub n. 428 (1864).

Papilio doubledayi Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 42. note (1865) (Moulmein; "Assam" *loc. err. aut subsp. alt.?*); Moore, *P. Z. S.* p. 840 (1878) (Upp. Tenasserim); Oberth., *El. d'Ent.* IV. p. 45. n. 64 (1879) (Burma); Dist., *Rhop. Mal.* p. 336. n. 4. t. 33. f. 4 (♀) (1885) (Mal. Pen.).

Papilio (Menelaides) doubledayi, Elwes & Nicéy., *Journ. As. Soc. Beng.* p. 435. n. 131 (1886) (Tavoy). *Menelaides doubledayi*, Moore, *Journ. Linn. Soc. Lond.* p. 51 (1889) (Mergui).

Though Messrs. Wood-Mason & Nicéville treat Butler's *cacharensis* as a synonym of *P. doubledayi* Wall., I must keep it separate as a subspecies, since it exhibits some characters by which it is pretty well distinguishable from *doubledayi* (see below).

(a): *P. doubledayi* Wall., forma typ. [♂, ♀].

The size of the white spots on the hindwings is very inconstant: in most specimens the white patch within the discoidal cell occupies two-thirds of the cell, but sometimes it is reduced to some small spots which stand in the apical half of the cell. The mark before the subcostal vein is about as large as the following one, but is in one of my specimens much smaller. The red spot at the extremity of the second median nervule is not connected with the corresponding submarginal mark, though in one of my specimens there are some red scales in the interspace between the two spots.

Hab. Burma (6 ♂, 1 ♀); Tenasserim (2 ♂); Malacca (1 ♀).

(b): *P. doubledayi cacharensis* Butl. [♂, ♀].

Papilio doubledayi, Butler (*nee* Wallace, 1865), *Tr. Ent. Soc. Lond.* p. 8 (1879) (Cachar).

Papilio cacharensis Butler, *Ann. Mag. N. H.* (5). XVI p. 334 n. 113 (1885) (near Assam; Cachar).

Papilio (Menelaides) doubledayi, Wood-Mas. & Nicéy., *Journ. As. Soc. Beng.* p. 377 n. 191 (1886) (Cachar).

Differs from *doubledayi* Wall. in its smaller size, paler brownish black colour of the wings, shorter post-cellular white spot of the hindwings, and in the much paler,

often yellowish red, marginal and submarginal markings in the anal region of the hindwings. Head, sides of breast, and abdomen are a yellowish red, instead of vermilion red.

The white spots on the hindwings are small; one of my specimens, labelled "Himalaya," to which Distant referred in his *Rhop. Mal.*, has the cellular mark reduced to a short streak.

Hab. Cachar (and probably the neighbouring districts) (3 ♂).

(c): **P. doubledayi sambilanga** Doherty [♂, ♀].

Papilio doubledayi var. *sambilanga* Doherty, *Journ. As. Soc. Beng.* p. 263, n. 20 (1886) (Great Nicobar; rather common).

White postcellular spot to the hindwings very short; marginal spot at the end of the lower median vein large and orange-red; the next marginal spot joined to the submarginal one, as in *P. rhodifer* Butl.

In the *female* the tails are shorter and broader than in the *male*.

Hab. Great Nicobar.

(d): **P. doubledayi delianus** Fruhst.

Papilio doubledayi, Hagen (*ver* Wallace, 1865), *Iris* II. p. 21, n. 14 (1894) (Sumatra).

Papilio doubledayi Wallace var. *delianus* Fruhstorfer, *Ent. Nachr.* p. 196 (1895) (Sumatra).

Body of a much yellower tint than in *doubledayi* Wall., being orange instead of red. Cellular spot to the hindwings much reduced, as in *P. doubledayi cacharensis* Butl.; middle discal spots small, the anterior one absent from the upperside. Marginal spots at the extremities of the two lower median branches as in *doubledayi* Wall.; submarginal mark in the upper median cellule not marked above; below, it stands separate from the marginal spot.

Hab. Sumatra (1 ♂, 1 ♀).

This form flies in the hills of the north-western parts of Sumatra; in the south-west it is replaced by typical *P. coon* Fabr.

12. **Papilio rhodifer** Butler [♂, ♀].

Papilio rhodifer Butler, *Ent. Mo. Mag.* XIII. p. 57 (1876) (Andaman Is.); Moore, *P. Z. S.* p. 592 (1877) (Andaman Is.); Oberth., *Et. d'Ent.* IV. p. 45, n. 63 (1879) (Pt. Blair); Wood-Mas., *Journ. As. Soc. Beng.* p. 240, n. 73 (1880) (Andaman Is.); id. & Nicéy., *l.c.* p. 253, n. 99 (1881) (Andaman Is.; descr. of ♀); Stauding. & Schatz, *Exot. Schmett.* I. p. 6, f. 3 (♂) (1884) (Andaman Is.); Haase, *Untersuch. üb. Min.* p. 26, t. 6, f. 40 (1893) (Andaman Is.).

The spots of the hindwings vary in size; the cellular mark reaches sometimes to the apex of the cell, while in other individuals it does not extend beyond the base of the lower median vein; the spot behind the cell is almost twice as large in some specimens as in others; mostly there are on the upperside four white spots round the apical half of the cell; sometimes, however, there appear two small spots between the second median and lower discoidal nervules, and a third one in front of the subcostal vein. The two marginal spots, which stand at the ends of the second and third median branch, are merged together with the respective submarginal markings. Apex of tail red.

Hab. Andaman Islands (15 ♂, 1 ♀).

43. *Papilio neptunus* Guér. [δ , φ].

Papilio neptunus Guérin, *Rev. Zool.* p. 43 (1840) (Mal. Pen.); id., in Delessert's *Souv. Voy. Ind.* II. p. 69 (1843) (*abdom. alien.*!); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 40 (1846) (Malacca); Gray, *Cat. Lep. Ins. B. M.* I. p. 15. n. 59 (1852) (Malacca); id., *List Lep. Ins. B. M.* I. p. 19. n. 63 (1856) (Malacca; Borneo); Feld., *Verh. z. b. Ges. Wien* p. 326. n. 481. & p. 374. n. 285 (1864) (Penang; Malacca; Borneo); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 42. n. 22 (1865) (Malacca; Borneo); Druce, *P. Z. S.* p. 357. n. 8 (1873); Oberth., *Et. d'Ent.* IV. p. 45. n. 62 (1879) (Penang); Standring & Schatz, *Errot. Schmett.* I. p. 6 (1884); Dist., *Rhop. Mal.* p. 335. n. 3. t. 33. f. 5 (δ). 6 (φ) (1885) (Mal. Pen.).

Papilio saturnus, Guérin, in Deless. *Voy. Ind.* II. t. 19 (1843) (*err. typoogr.*).

Papilio thetys Guenée, *Lép. Mus. Genève.* p. 9. 10. t. 1. f. 5 (1878); Oberth., *Et. d'Ent.* IV. p. 113. n. 62 *bis* (1879) (Borneo).

-(a): *P. neptunus* Guér., forma typ. [δ , φ].

In Delessert's *Souv. Voy. Ind.* the plates 19 and 20 are erroneously lettered *saturnus* (19) and *neptunus* (20) respectively, instead of *neptunus* (19) and *saturnus* (20).

The number of spots composing the red patch on the hindwings is inconstant; below, the spots are much dusted with black scales. The specimens with two red spots only are Hagen's *sumatranus*.

(a²): ab. *sumatranus* Hagen.

Papilio neptunus var. *sumatranus* Hagen, *Iris* VII. p. 21. n. 13 (1894) (Sumatra).

This aberration is *not* confined to Sumatra, but seems to be there the usual form.

Hab. Malay Peninsula; Sumatra (1 δ); Borneo (7 δ , 9 φ).

(b): *P. neptunus fehri* Honr. [δ , φ].

Papilio neptunus, Kheil (*ucc* Guérin, 1840), *Rhop. Nias* p. 36. n. 138 (1881) (Nias).

Papilio neptunus var. *fehri* Honrath, *Berl. Ent. Zeit.* p. 432 (1891) (Nias).

White bands of the forewings strongly suffused with black.

The red patch on the forewings consists above mostly of two spots only, which are rather small, and vary in colour from red to buff.

Hab. Nias Island (1 δ , 3 φ).

III. NOX-GROUP.

Anal valves of *male* normal. Abdominal fold of *male* large, including a cottony scent-organ. Both sexes tailless. Legs similar to those of the preceding group, but hind tibiae of *male* less thickened and fourth tarsal joint longer.

A. Abdominal fold of δ (when wholly expanded) with a fringe of long hairs.

a. Abdomen yellowish or red at the sides and below.

44. *Papilio priapus* Boiscl. [δ , φ].

δ φ . *Papilio priapus* Boisduval, *Spec. Gén. Lép.* I. p. 190. n. 3 (1836) (Java); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 23. t. 2. f. 1 (φ) (1840) ("Pontianak, Borneo" *loc. err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 27 (1846) (Java); Gray, *Cat. Lep. Ins. B. M.* I. p. 12. n. 43 (1852) (Java); Vollenhov., *Tijdschr. v. Ent.* III. p. 72. n. 2 (1860) ("Pontianak, Borneo" *loc. err.*); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 471. & p. 373. n. 280 (1864) (Java; *ucc* Borneo, *ucc* Sumatra); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 47. n. 46 (1865) (Java; *ucc* Borneo, *ucc* Sumatra); Oberth., *Et. d'Ent.* IV. p. 34. n. 6 (1879) (Java: "specimen typicum," δ); Haase, *Untersuch. üb. Mim.* p. 27. t. 6. f. 42 (φ) (1893) (Java; *ucc* Borneo, *ucc* Sumatra).

This species does certainly not occur in Borneo (cf. De Haan, *l.c.*); if there is any representative in Borneo, it will most probably be more closely allied to *syceurae* Grose Smith than to *priapus* Boiscl.

(a): *P. priapus* Bois-d., forma typ. [♂, ♀]

Hab. W. Java (4 ♂, 6 ♀).

The spots within the creamy band of the hindwings vary much in size; the *male* has mostly three, the *female* four spots. The amount of black on the underside of the abdomen is also inconstant.

(b): *P. priapus dilutus* Fruhst. [♂, ♀].

♂ ♀. *Papilio dilutus* Fruhstorfer, *Ent. Nachr.* p. 169 (1895) (E. Java).

Wings paler, abdomen much more extended black, than in the typical race.

Hab. E. Java (5000 feet).

45. *Papilio sycorax* Grose Smith [♂, ♀].

Papilio priapus, Gray (*acc* Boisduval, 1836), *List Lep. Ins. B. M.* I. p. 14. n. 47 (1856) (Sumatra: this species according to the specimens in the British Museum).

♀. *Papilio sycorax* Grose Smith, *Ent. Mo. Mag.* XXI p. 247 (1885) (Sumatra): Dist., *Rhop. Mal.* p. 468. n. 29. t. 42. f. 10 (♀) (1886) (Perak).

♀. *Papilio egertoni* Distant, *Ann. Mag. N. H.* (5). XVII. p. 251 (1886) (Perak).

♂ ♀. *Papilio (Pangerana) sycorax*, Nicéville, *Journ. Bombay N. H. Soc.* p. 54. t. m. f. 1 (♂) (1893) (Sumatra).

♂ ♀. *Papilio sycorax*, Hagen, *Iris* VII. p. 23. n. 23 (1894) (Sumatra: descr. of ♂).

Abdomen yellowish buff, with small black lateral spots.

The wings have a peculiar greenish gloss, which sometimes assumes a more bluish green tint.

My Perak specimen (from Distant's coll.) is somewhat darker than my Sumatran individuals, but, considering the differences of the Sumatran specimens *inter se*, it cannot be kept under a subspecific name.

Hab. Sumatra (1 ♂, 3 ♀); Malacca (1 ♀).

46. *Papilio hageni* Rogenh. [♂, ♀].

♂. *Papilio hageni* Rogenhofer, *Verh. z. b. Ges. Wien* p. 1 (1889) (Sumatra).

♀. *Papilio (Pangerana) hageni*, Nicéville, *Journ. Bombay N. H. Soc.* p. 55. t. m. f. 2 (♀) (Sumatra).

♂. *Papilio (Pangerana) hageni*, Nicéville, *Journ. As. Soc. Beng.* p. 45. n. 39. t. 4. f. 6 (1894).

♂ ♀. *Papilio hageni*, Hagen, *Iris* VII. p. 24. n. 24 (1894) (Batak Mts., Sumatra).

This species represents *P. sycorax* in the mountainous regions of Sumatra. It is easily distinguished from either *sycorax* or *priapus* by the breast and abdomen being red instead of buffish yellow.

Hab. Sumatra (Batak Mountains) (1 ♂).

47. *Papilio semperi* Feld. [♂, ♀].

(?). *Papilio jupiter* Boisduval, *Bull. Soc. Ent. France* p. 39 (1861) (*nom. nud.*).

♀. *Papilio semperi* Felder, *Wien. Ent. Mon.* V. p. 297. n. 1 (1861) (Luzon).

♂. *Papilio semperi* Felder, *l.c.* VI. p. 232. n. 32 (1862).

♂ ♀. *Papilio semperi* Felder, *Verh. z. b. Ges. Wien* p. 325. n. 468 (1864) (Luzon): id., *Reise Novara, Lep.* I. p. 131. n. 97. t. 20. f. a (♂). b (♀) (1865) (Luzon): Wall., *Tr. Linn. Soc. Lond.* XXV p. 42. n. 21 (1865) (Luzon); Stauding. & Schatz, *Exot. Schmett.* I. p. 9. t. 5 (♂) (1884); Haase, *Untersuch. üb. Mim.* p. 27 (1893).

♂. *Atraphaenara erythrosoma* Reakirt, *Tr. Ent. Soc. Phil.* p. 447. n. 2 (1864) ("Philippines").

♂ ♀. *Papilio (Atraphaenara) semperi*, Semper, *Philipp., Tagfall* p. 272. n. 399. t. 47. f. 1 (♀) (1892) (Luzon: Polillo; *see caet. Ins. Philipp.*).

This conspicuous insect inhabits all the islands of the Philippine group, including Palawan; from the latter locality only one *female* has as yet been received. Whilst

the *males* do not vary according to locality, the *female* sex has developed into four forms, so that we have to divide *semperi* into as many subspecies;—

(a): *P. semperi* Feld. from Luzon and Polillo;

(b): *P. semperi supernotatus* m. from Samar, Bohol, Mindanao, and the adjacent smaller islands;

(c): *P. semperi albofasciatus* Semper from Panay and Mindoro;

(d): *P. semperi melanotus* Stauding. from Palawan.

(a): **P. semperi** Feld., forma typ. [♂, ♀].

♂. As in all subspecies of *semperi*, the number and size of the spots on the underside of the hindwings vary rather much.

♀. The markings of the hindwings are feebly indicated on the upperside.

Hab. Luzon (8 ♂, 3 ♀); Polillo.

(b): **P. semperi supernotatus** subsp. nov. [♂, ♀]

♂ ♀. *Papilio (Atrophaneura) semperi*, Semper (nec Felder, 1861), *Philipp., Tayfakt.* p. 272. n. 399 (p.p.). t. 47. f. 2. 3 (♀) (1892) (Samar: Bohol; Mindanao: Camiguin; Panaon; Siargao).

♂. Not different from typical *semperi* Feld.

♀. Forewings paler than in *semperi*; hindwings with the markings of the underside also more or less developed on the upperside, but of a reddish white colour. According to Semper, the specimens from Bohol and Samar have the posterior portion of the outer margin of the hindwings (from the anal angle to the second discoidal nervule) dirty white, which is seldom the case in the Mindanao individuals; in the latter the markings of the upperside are also larger. Most probably the Mindanao, Camiguin, Panaon, etc., examples form a fifth subspecies.

Hab. Bohol (type, 1 ♀); Samar; Mindanao (3 ♂, 2 ♀); Panaon; Camiguin; Siargao.

(c): **P. semperi albofasciatus** Semper [♂, ♀].

♀. *Papilio (Atrophaneura) semperi* var. *albofasciata* Semper, *l.c.* p. 273. sub n. 399 (1892) (Panay; Mindoro).

♂ ♀. *Papilio semperi* var. *albofasciatus* Staudinger, *Iris* VII. p. 349 (1895) (Mindoro).

♂. Identical with typical *semperi* Feld.

♀. Forewings with a broad white macular band; hindwings similar to those of *supernotatus* m.

Hab. Panay; Mindoro (1 ♂, 1 ♀).

(d): **P. semperi melanotus** Stauding. [♂, ♀].

♀. *Papilio semperi* var. *melanotus* Staudinger, *Iris* II. p. 13 (1889) (Palawan).

♂. Unknown.

♀. Thorax and abdomen black above; otherwise similar to typical *semperi*.

Hab. Palawan (1 ♀, in coll. Staudinger).

48. **Papilio aidoneus** Doubl. [♂, ♀].

♂. *Papilio aidoneus* Doubleday, *Ann. Mag. N. H.* XVI. p. 178 (1845) (Himalaya): id. Westw & Hew., *Gr. Diura. Lep.* I. p. 9. n. 13 (1846): Gray, *Cat. Lep. Ins. B. M.* I. p. 8. n. 29 (1852): id., *List Lep. Ins. B. M.* I. p. 9. n. 32 (1856): Feld., *Verh. z. b. Ges. Wien* p. 325. n. 467 (1864).

♀. *Papilio erioleuca* Oberthur, *El. d'Ent.* IV. p. 33. n. 5. t. 3. f. 1 (1879) (Darjeeling): id., *l.c.* XVII. p. 1 (1893) (Tonkin).

♀. *Papilio erioleuca*, Nicéville, *Journ. As. Soc. Beng.* p. 98. n. 256 (1883) (Calcutta: descr. of ♀).

♂ ♀. *Papilio (Pungerana) erioleuca*, Wood-Mason & Nicéville, *ibid.* p. 375. n. 178 (1886) (Cachar).

- ♂ ♀ *Papilio aidoneus*, Elwes, *Tr. Ent. Soc. Lond.* p. 123 n. 596 (1888) (Sikkim; not uncommon at 2000 to 3000 feet, from April to November; *P. erioleuca* Oberth. = *aidoneus* Doubl.); Manders, *ibid.* p. 535. n. 186 (1890) (Shan States; not an uncommon species).
 ♂ ♀ *Papilio (Pangrana) aidoneus*, Nicéville, *Gazetteer of Sikkim* p. 170. n. 461 (1894) (Sikkim; rarer than *astorion* Westw., up to 3000 feet, from April to November).

Mr. Elwes was the first to recognise the identity of *erioleuca* Oberth. and *aidoneus* Doubl.

The hairs of the front of the head are sometimes partly black. The specimens from the Shan States, Bhutan, Sikkim, and Kumaon do not differ from each other.

This is the only species of Eastern *Papilio* which has the underside of the abdominal fold covered with a similar kind of scaling as we met with in *Troides* Hübn. (see p. 195).

Hab. Kumaon (2 ♂, 1 ♀; July 1893, Pileher *leg.*); (Nepaul, probably); Sikkim 14 ♂, 6 ♀); Bhutan (4 ♂, 1 ♀); Naga Hills (1 ♂, 1 ♀); Shan States (2 ♂).

b. Abdomen black, with the tip red below.

49. *Papilio kühni* Honr. [♂, ♀].

- ♂ ♀ *Papilio kühni* Honrath, *Berl. Ent. Zeitsch.* XXX. p. 294 t. 6. f. 1 (♂). 1a (♀) (1886 (Tombugu, E. Celebes).

Both sexes have a large discal carmine-red spot on the underside of the hindwings, between the anal angle and the second discoidal vein.

Hab. E. Celebes (in coll. Godman & Salvin and H. J. Adams).

B. Margin of the abdominal fold of ♂ (when wholly expanded) with a fringe of long hairs.

c. Abdomen black, or red only at the tip. Basal partition of the subcostal nervure to hindwings short.

50. *Papilio nox* Swains. [♂, ♀].

- Papilio nox* Swainson, *Zool. Illustr.* III. t. 102 (♀) (1822-23) (Java); Horsf., *Cat. Lep. Ins. Mus. E. I. C. I. t. 1. f. 15* (1828); Boisdu, *Spec. Gén. Léop.* I. p. 277. n. 100 (1836) (Java; ♂, ♀); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 41 (1840) (Java; *nee* Borneo); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 12 (1846) (Java; *nee* Penang); Lucas, in Chenu's *Enc. d'Hist. Nat., Pup.* t. 7 (1851-53); Gray, *Cat. Lep. Ins. B. M.* I. p. 8. n. 28 (1852) (*sub synonym.*); id., *List Lep. Ins. B. M.* I. p. 9. n. 31 (1856) (*sub synonym.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I. p. 89. n. 180* (1857) (Java; *synonym. ex p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 80. n. 80 (1860) (Java; *nee* Borneo); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 469 (1864) (Java; *nee* Penang); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 41. n. 17 (1865) (Java; *nee* Penang); Westw., *Tr. Ent. Soc. Lond.* p. 91-93. t. 4. f. 1 (♂) (1872); Oberth., *Et. d'Ent.* IV. p. 33. n. 2 (1879) (Java); Stauding. & Schatz, *Exot. Schmett.* I. p. 9 (1884); Pagenstech., *Jahrb. Nass. Ver. Nat. p.* 100. n. 143 (1890) (E. Java); Haase, *Untersuch. üb. Mim.* p. 28 (1893) (Java; *nee* Penang).

- ♂ *Papilio memercus* Godart, *Enc. Méth.* IX. Suppl. p. 809. n. 12. 13 (1823).

- Papilio uersius* Zinken, *Nova Act. Ac. Nat. Cur.* XV. p. 152. n. 7. t. 14. f. 4 (1831) (Java).

This and the allied species, *noctula*, *erebus*, *noctis*, can be separated as follows:—

A. *Males.*

a. Upperside black, with a faint metallic blue gloss; forewings brownish at apex; hindwings indented. *P. nox* Swains.; Java.

b. Forewings beyond cell, and hindwings with a beautiful cyanid blue gloss; forewings with narrow whitish streaks at the lower subcostal, the discoidal, and the upper median nervules; outer margin of hindwings scarcely sinuate. *P. noctula* Westw.; Borneo.

c. Similar to *noctula* Westw. in colour; forewings narrower, outer margin of hindwings almost entire; oval red mark of the head smaller.

P. erebus Wall.; Malacca, Sumatra, Borneo.

d. Forewings velvety black, with a blue gloss towards anal angle; hindwings dark steel-blue; collar and sides of the mesosternum much less extended red than in *erebus*.

P. noctis Hew.; Borneo.

B. Females.

a. Upperside brown; forewings whitish between apex and discoidal cell.

P. nox Swains.

b. Upperside brown; both wings with narrow, adnervular, whitish streaks.

P. noctula Westw.

c. Upperside of forewings brown, with adnervular white streaks in apical region; hindwings opalescent blue.

P. erebus Wall.

d. Upperside brown; nervules margined with dirty white in apical region of the forewings; hindwings with creamy buff marginal band, much dusted with brown scales, and including a series of submarginal, internervular, brown spots.

P. noctis Hew.

In *P. nox* Swains. the anal valves of the *male* are more or less red; sometimes they look quite black, but the red hairs are always visible under a lens.

Hab. Java (10 ♂, 6 ♀).

51. *Papilio noctula* Westw. [♂, ♀].

♂. *Papilio noctula* Westwood, *Tr. Ent. Soc. Lond.* p. 90. t. 4. f. 3 (1872) (Borneo).

♀. *Papilio stric* Westwood, *l.c.* p. 92. t. 4. f. 4 (1872) (Borneo).

♂ ♀. *Papilio noctula*, Kirby, *Syn. Cat. Diurn. Lep.* Suppl. p. 813. n. 378 (1877).

The adnervular streaks of the *female* are in Westwood's figure too broad, and the ground-colour of the wings is much too black. The anal valves of the *male* have sometimes red scales.

Hab. Borneo (6 ♂, 3 ♀).

52. *Papilio erebus* Wall. [♂, ♀].

♀. *Papilio nox* var., De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 41. t. 5. f. 3 (1840) (Banjermassing, Borneo).

Papilio nox, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 12 (1846) (Penang; *nee* Java): Gray, *Cat. Lep. Ins. B. M.* I. p. 8. n. 28 (1852) (Penang; *synon. ex p.*); id., *List Lep. Ins. B. M.* I. p. 9. n. 31 (1856) (Penang; *synon. ex p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 80. n. 80 (1860) (Borneo; *nee* Java); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 469 (1864) (Penang; *nee* Java); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 41. n. 17 (1865) (Penang; *nee* Java); Haase, *Untersuch. üb. Mim.* p. 28 (1893) (Penang; *nee* Java).

♀. *Papilio erebus* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 41. n. 19 (1865) (Malacca; Borneo): Westw., *Tr. Ent. Soc. Lond.* p. 91-93 (1872).

♂ ♀. *Papilio erebus*, Oberthür, *Et. d'Ent.* IV. p. 111. n. 3 *bis* (1879) (Sumatra); Dist., *Rhop. Mal.* p. 334. n. 1. t. 31. f. 1 (♂). 2 (♀) (1885) (Mal. Pen.; first descr. & fig. of ♂); Ilagen, *Iris* VII. p. 26. n. 25. t. 1. f. 2 (t.) (Sumatra).

Distant (*l.c.*) says that "Prof. Westwood also gave a description of what he considered the *female* of *P. erebus* as 'black above' which, with other characters enumerated, do not apply to the species." If we compare, however, what Westwood (*l.c.*) says on page 91 about the *female* of *erebus*, of which that sex was alone known at the time, it is quite clear that Westwood's *erebus* was indeed this species.

In Dr. Standinger's collection are two *females* from S.E. Borneo, which are distinguished by the anal region of the forewings having a distinct bluish opalescent gloss, which in my Malaccan specimens is visible (not always) only on the submedian

nervule, and by the nervules of the hindwings below being scarcely bordered with buffish white scales. The streaks of the forewings are rather white and broad, especially near the apex of the cell.

A Bornean *male* in my collection agrees with Malaccan *males*, but is rather larger.

Hab. Malay Peninsula (3 ♂, 8 ♀); Sumatra (2 ♂, 2 ♀); Borneo (1 ♂).

53. *Papilio noctis* Hew. [♂, ♀].

♀. *Papilio noctis* Hewitson, *P. Z. S.* p. 423. t. 66. f. 5. 6 (1859) (Borneo); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 470 (1864) (*excl. of synonym.*).

♂ ♀. *Papilio noctis* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 41. n. 18. t. 5. f. 1 (♂) (1865) (Sarawak: Borneo); Westw., *Tr. Ent. Soc. Lond.* p. 91-93. t. 4. f. 2 (♂), 5 (♀) (1872); Oberth., *Et. d'Ent.* IV. p. 33. n. 3 (1879) (Borneo); Standing & Schatz, *Exot. Schmett.* I. p. 9 (1884).

♂. The hindwings are decidedly shorter and rounder than in *P. erebus* Wall., the discoidal veins being obviously shorter than in that species; the forewings are broader. In the colour of the wings both species are similar to one another, *noctis* being of a feebly darker steel-blue tint than *erebus*.

P. noctula has a much richer blue gloss than *noctis*, and shows buffish adnervular streaks in the apical region of the forewings.

♀. Forms in pattern a kind of transition to *P. juiapus* and allies.

Hab. Borneo (2 ♂, 6 ♀).

d. Abdomen pale red at the sides and below.

54. *Papilio varuna* White [♂, ♀].

Papilio varuna White, *Entomol.* I. p. 280 (♀) (1842, March) (Penang); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 11 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 8. n. 27 (1852) (Penang: *nee* Sylhet); id., *List Lep. Ins. B. M. I.* p. 9. n. 30 (1856) (Penang; *nee* Sylhet); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 42. n. 20 (1865) (Penang; *nee* Sylhet); Butl., *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 553. n. 20 (1877) (Malacca); Distant, *Rhop. Mal.* p. 334. n. 2. t. 31. f. 3 (♂). 4 (♀) (1886) (Mal. Pen.).

The North Indian and Malaccan specimens of this species, which are usually treated as the same, exhibit in both sexes some differences, which render it necessary to keep the Malaccan *varuna* and the North Indian *astorion* subspecifically separate.

(a): *P. varuna* White, forma typ. [♂, ♀].

♂. Forewings below with white streaks in the outer region, especially towards the anal angle, which are seldom visibly indicated in the following race.

♀. Ground-colour of the wings darker than in *astorion*; the white area in the anal region of the forewings is of a much purer white colour, and more extended.

Hab. Malay Peninsula (2 ♂, 1 ♀).

The ranges of *varuna* and *astorion* are separated by a large district (Tenasserim, Burma, Shan States), where the species has not been found.

(b): *P. varuna astorion* Westw. [♂, ♀].

♂. *Papilio astorion* Westwood, *Ann. Mag. N. H.* IX. p. 37 (1842) (Sylhet); id., *Arc. Ent.* II. p. 69. t. 66. f. 1 (1844).

♀. *Papilio chava* Westwood, *l.c.* p. 37 (1842) (Sylhet); id., *Arc. Ent.* II. p. 69. t. 66. f. 2 (1844).

Papilio varuna, Gray, *Cat. Lep. Ins. B. M. I.* p. 8. n. 27 (1852) (Sylhet; *nee* Penang); id., *List Lep. Ins. B. M. I.* p. 9. n. 30 (1856) (Sylhet; *nee* Penang); Horsf. & Moore, *Cat. Lep. Ins. Mus. F. I. C. I.* p. 98. n. 199 (1857) (Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 466 (1864) (India sept.); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 42. n. 20 (1865) (Sylhet; *nee* Penang); Moore, *P. Z. S.* p. 756 (1865) ("Bengal"); Oberth., *Et. d'Ent.* XVII. p. 1 (1893) (Tonkin).

♂ ♀. *Papilio astorion* Oberthur, *Et. d'Ent.* IV. p. 33. n. 1 (1879) (Sythet). Nicéy., *Journ. As. Soc. Beng.* p. 59 (1881) (Sikkim, October); Elwes, *Tr. Ent. Soc. Lond.* p. 422. n. 395 (1888) (Sikkim; not uncommon in both sexes at low elevations, and found up to 7000 feet: April to December).

Papilio (Pangerana) astorion, Wood-Mas. & Nicéy., *Journ. As. Soc. Beng.* p. 375. n. 179 (1886) (Cachar); Nicéy., *Gazetteer of Sikkim* p. 170. n. 460 (1894) (Sikkim: common from April to December, up to 7000 feet).

Pangerana varana, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312. n. 379 (1893) (Khasia Hills).

The amount of white on the forewings is rather variable; some specimens are scarcely different in respect to the white patch from *P. varana*. On the hindwings there appear not seldom white scales on the disc about midway between the discoidal cell and the outer margin; this white sealing increases sometimes so much as to form a white discal band, which outwardly is concave between the nervules and rather well defined, while it inwardly gradually shades off.

The abdominal fold of the *male* is the same as in *varana*.

Hab. Assam (1 ♂); Sikkim (8 ♂, 8 ♀); Naga Hills (1 ♂, 2 ♀); Tonkin.

55. *Papilio zaleucus* Hew. [♂, ♀].

♂ ♀. *Papilio zaleucus* Hewitson, *Erot. Buttl.* III. *Pap.* t. 7. f. 24 (♂), 25 (♀) (1865); Moore, *P. Z. S.* p. 841 (1878) (Upp. Tenasserim); Haase, *Untersuch. üb. Mim.* p. 28 (1893) (Burma); Oberth., *Et. d'Ent.* XVII. p. 1 (1893) (Tonkin).

♂ ♀. *Papilio (Pangerana) zaleucus*, Elwes & Nicéville, *Journ. As. Soc. Beng.* p. 436. n. 134 (1886) Pongskai).

♂. The hindwings have mostly three triangular white patches, which include often a black spot each; sometimes the patches have a reddish tint.

♀. The white patches are larger, broader, and mostly five in number.

Hab. Burma; Upper Tenasserim; Shan States (7 ♂, 3 ♀); Tonkin.

IV. LATREILLEI-GROUP.

Anal valves of *male* normal; abdominal fold and scent-organ strongly developed. Hindwings of both sexes elongate, with tails.

In the form of the cell to the hindwings the species of this group come nearest to *P. zaleucus*, *semperi*, *prätus*, *aidoneus*, etc.; in *P. nov* and allies the basal partition of the subcostal nervure is much shorter than in the other species of the *nov*-group and in the species of the present group.

56. *Papilio latreillei* Don. [♂, ♀].

Papilio latreillei Donovan, *Nat. Repos.* II. t. 140 (1826) (Nepal); Kirby, *Syn. Cat. Diurn. Lep.* p. 554. n. 234 (1871); Stauding. & Schatz, *Erot. Schmett.* I. p. 9 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 425. n. 399 (1888) (Sikkim; not uncommon at 7000 to 9000 feet; dense forest, where it flies high over the tops of the trees; April to July or August).

Papilio philoxerus ♀, Boisduval, *Spec. Gén. Léop.* I. p. 265. n. 88 (1836).

Papilio minereus Gray, *Zool. Misc.* p. 32 (1831) (Nepal); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 16 (1846); Gray, *Lep. Ins. Nepaul.* p. 5. t. 1 (1846); Westw., *Cab. Or. Ent.* p. 81. t. 40. f. 1 (1848); Gray, *Cat. Lep. Ins. B. M. I.* p. 9. n. 32 (1852) (Nepal); id., *List Lep. Ins. B. M. I.* p. 10. n. 35 (1856) (Nepal); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 97. n. 197 (1857) (Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 478 (1864).

Papilio (Byasa) latreillei, Nicéville, *Gazetteer of Sikkim* p. 171. n. 465 (1894) (Sikkim: 7000 to 9000 feet; thick, high forest, March to August).

The three white patches on the disc of the hindwings vary considerably in size; they are always larger in the *female* than in the *male*. The *females* have often an

additional spot in front of the second discoidal nervule, and always another mark at the anal angle, which is seldom indicated above in the other sex. In one of my *males* the tail is rather thin, and scarcely narrowed towards the base; the spot at the apex of the tail is very feebly marked above in this specimen. Between the subcostal and the upper discoidal nervules there stands sometimes a white submarginal spot on the underside of the hindwings in the *male*; in the *female* this spot is always present below, and in some individuals also above.

The scent-organ of the *male* is creamy white.

Hab. Nepal; Sikkim (6 ♂, 4 ♀).

In the Felder collection there is one *male* of this species labelled Mussoree; the locality label of this specimen belongs most probably to that individual of *P. ravana* Moore in the Feld. coll. which bears the label "Darjeeling, Stoliczka," while the latter label belongs to the "Mussoree" example of *latreillei*.

57. *Papilio crassipes* Oberth. [♂].

♂. *Papilio crassipes* Oberthür, *Et. d'Ent.* XVII. p. 2. t. 4. f. 38. 38a (♂) (1893) (Tonkin).

In the shape of the hindwings this insect comes close to *P. latreillei* Don.; in the position of the submarginal spots of the hindwings it agrees with *latreillei* Don. and *aleinous* Klug. The short and feebly spatulate tails bear, as in *latreillei*, a red spot; the scent-organ of the *male* is white, as in that species; but there are no discal white markings to the hindwings. The thickened hinder tibiae are not peculiar to *P. crassipes* Oberth.; we find them in *philoxenus* Gray, and especially in *aleinous* Klug, *aleinous menciis* Feld., *polytorus* L., and several other species, though in *crassipes* the hind tibiae seem to be rather thicker than in any other *Papilio*.

Hab. Tonkin.

58. *Papilio adamsoni* Grose Smith [♂, ♀].

♂. *Papilio adamsoni* Grose Smith, *Ann. Mag. N. H.* (5). XVIII. p. 149 (1886, August) (Saluen R., Shan States); id. & Kirby, *Rhop. Exot.* I. *Pap.* p. 11. t. 5. f. 3. 4 (1888).

♂ ♀. *Papilio (Byasa) minerooides* Elwes & Nicéville, *Journ. As. Soc. Beng.* LV. p. 435. n. 133. t. 20. f. 2. 2b (♂). 3 (♀) (1887; the paper read in November 1886) (Simboodine and Ponekai).

Smaller and darker than *P. latreillei* Don.; the hindwings are shorter and their outer margin more scalloped; the tails are without a red spot; the basal half of the hindwings is broader than in *latreillei*; the discal white spots are mostly reddish white; they vary in number from three to five; the anterior one standing before the second discoidal nervule is often joined to the corresponding submarginal mark. The *female* is much paler above than the *male*, as is generally the case in the species of this group.

Hab. Shan States of Burma and Siam (5 ♂).

P. adamsoni bears a striking resemblance to *P. aristolochiae* Fabr. As both species belong to the nauseous *Papilios*, the similarity in pattern cannot be accounted for by mimicry; we have here certainly a beautiful case of parallel development.

59. *Papilio ravana* Moore [♂, ♀].

Papilio philoxenus var., Westwood, *Cub. Or. Ent.* p. 81. t. 40. f. 4 (♀) (1848) (*Hab.?*); Gray, *Cat. Lep. Ins. B. M.* I. p. 9. sub n. 31 (1852) ("Northern India"); id., *List Lep. Ins. B. M.* I. p. 10. sub n. 34 (1856) ("N. India").

Papilio ravana Moore, in Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 96. n. 196 (1857) ("Darjeeling" *loc. err.*?; no description; Westwood's figure must, therefore, be regarded as *typ.*); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 475 (1864) ("Darjeeling" *loc. err.*?); Elwes, *Tr. Ent. Soc. Lond.* p. 423. n. 397 (1888) (the evidence of the occurrence of this species in Sikkim is doubtful).

Byasa ravana Moore, *P. Z. S.* p. 259 (1882) (N.W. Himalaya).

Papilio (Byasa) ravana, Nicéville, *Gazetteer of Sikkim* p. 171. n. 463 (1894) (the occurrence in Sikkim is doubtful).

As this insect is constantly different from *P. philoxenus*, especially in the position of the large white patch on the hindwings, it represents certainly a distinct species.

♂. *Upperside, hindwings*: the white spot between the subcostal and upper discoidal nervules is often very small or even absent; on the disc between the lower median veins there is in one example a small reddish white mark above, half-way between the cell and the submarginal lunule; another specimen has, moreover, a small anal spot; the geminate spot at the apex of the tail is very small and sometimes obliterated.

Underside: some specimens have a small white submarginal spot behind the costal margin; besides the pinkish white anal mark there are mostly some discal spots, often forming a complete macular band which connects the large white patch between the discoidal veins with the anal spots; in one individual the discal spot between the upper median and lower discoidal veins is merged together with the corresponding submarginal mark. The spots at the apex of the tail are always larger than above.

♀. Varies in a similar way as the *male*. The hindwings have above always a distinct anal mark, and besides mostly some discal markings, of which that before the upper median nervule is in two of my specimens joined to the submarginal mark. The underside of the abdomen is mostly as black as in *P. philoxenus lama* Oberth.

Hab. Cashmere (Kulu; 7 ♂, 2 ♀); Kumaon (1 ♀); (Darjeeling; 1 ♀; Stoliczka *leg.*, coll. Felder).

My supposed Sikkim specimen is rather larger than those from Kulu. As no specimen of *ravana* has been found in Sikkim more recently, the occurrence of this species in that country remains still doubtful (see *P. latreillei* Don.).

60. *Papilio nevillei* Wood-Mas. [♂, ♀].

Papilio ravana, Oberthür (*nec* Moore, 1857), *Et. d'Ent.* IV. p. 43. n. 53 (1879) (China).

Papilio nevillei Wood-Mason, *Ann. Mag. N. H.* (5). IX. p. 105. n. 2 (1882) (Cachar); Elwes, *Tr. Ent. Soc. Lond.* p. 424. sub n. 397 (1888) (*P. cheatsong* Oberth. = *nervillei* Wood-Mas.); Leech, *Butterfl. of China*, etc. p. 543 (1893) (Western Chioa; large number of specimens; found in most of the localities visited by Mr. Leech's collectors).

Papilio (Panosmia) nevillei, Wood-Mason & Nicéville, *Journ. As. Soc. Beng.* p. 374. n. 177. t. 15. f. 2. 2a (♂) (1886) (Silehar; Cachar).

Papilio cheatsong Oberthür, *Et. d'Ent.* XI. p. 13. t. 1. f. 1 (♂) (1886) (Yerkalo, W. China).

Differs from *P. ravana* Moore, especially in the absence of the red spot near the apex of the tail, and in the scent-organ of the *male*, which is blackish brown in *ravana* and creamy white in *nervillei*.

The first white or reddish white submarginal spot on the upperside of the hindwings, standing behind the subcostal nervule, is sometimes absent or greatly reduced; the large white mark is also variable in size, and so are the three posterior submarginal spots, of which the two last are wanting in a few specimens; the spot

at the anal angle is seldom marked above, and also sometimes absent from the underside. In none of my (*male*) specimens are there discal spots between the lower discoidal and second median nervules.

Hab. Cachar; Western China (15 ♂).

61. *Papilio philoxenus* Gray [♂, ♀ larva, pupa].

- Papilio philoxenus* Gray, *Zool. Misc.* p. 32 (1831) (Nepaul); id., *Ins. of Nepaul* t. 2 (1833); Boisd., *Spec. Gén. Lép.* I. p. 264. n. 88 (1836) (*synon. p.p.*; "*nimerous* Gray = ♀ of *philoxenus* Gray" *ex err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 14 (1846) (N. India); Gray, *Ins. of Nepaul* p. 5 (1846); Westw., *Cub. Or. Ent.* p. 81 (*p.p.*), t. 40. f. 2. 3. 5 (1848) (Assam; Sylhet; Nepal); Gray, *Cat. Lep. Ins. B. M. I.* p. 9. n. 31 (1852) (*nec* "var. e"); id., *List Lep. Ins. B. M. I.* p. 10. n. 34 (1856) (*nec* "var. e"); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 96. n. 194 (1857) (Darjeeling; Cherra Punji); Feld., *J'erb. z. b. Ges. Wien* p. 325. n. 477 (1864) (Darjeeling; Sylhet; Nepal); Moore, *P. Z. S.* p. 757 (1865) (Bengal); id., *l.c.* p. 840 (1878) (Upp. Tenasserim); Oberth., *Et. d'Ent.* IV. p. 43. n. 51 (1879) (Nepal); Nicév., *Journ. As. Soc. Beng.* p. 53 (1881) (Sikkim, October); Standing & Schatz, *Exot. Schneitt.* I. p. 9. t. 5 (♂) (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 426. n. 401 (1888) [Sikkim; common at the same elevations and in the same months as the last (*dasarada* Moore)]; Manders, *ibid.* p. 535. n. 187 (1890) (Shan States; abundant and widely distributed); Nicév., *Journ. Bombay N. H. Soc.* p. 387. n. 89 (1890) (Chin-Lushai); Oberth., *Et. d'Ent.* XVII. p. 2 (1893) (Tonkin).
- Byssa philoxenus*, Moore, *P. Z. S.* p. 259. t. 12. f. 5 (*l.*) 5a (*p.*) (1882) (N.W. Himalaya); Swinh., *Tr. Ent. Soc. Lond.* p. 312. n. 381 (1893) (Khasia Hills).
- Papilio (Byssa) philoxenus*, Doherty, *Journ. As. Soc. Beng.* p. 136. n. 229 (1886) (Kumaon); Elwes & Nicév., *ibid.* p. 435. n. 132 (1886) (Ponsekai); Nicév., *Gazetteer of Sikkim* p. 171. n. 467 (1894) (Sikkim; common at the same elevations and times of the year as *P. dasarada* Moore).

Though Mr. Leech [*Butterfl. of China, etc.*, p. 538 (1893)] is quite right in saying that the Chinese *P. lama* of Oberthür is connected with the Indian *P. philoxenus* Gray by a continuous chain of intergraduate specimens, I cannot agree with him in treating *lama* Oberth. as a mere synonym of *philoxenus*. The Chinese individuals are on the whole distinguishable by some slight characters, which render it necessary to keep *lama* separate from *philoxenus* as a subspecies. The present insect has, therefore, two local forms, and occurs all over Western China, Tibet (probably), N.W. Himalaya, Northern India, Burma, Tenasserim, Malay Peninsula, Siam, and Tonkin; it has not been found in Central and Eastern China, or in the Central and Southern provinces of W. India.

(a): *P. philoxenus* Gray, forma typ. [♂, ♀].

With the Indian subspecies of *philoxenus* I must unite as individual aberrations *P. dasarada* Moore and *P. polyeretes* Doubl., as it is impossible to draw parting lines between these three "species." *P. philoxenus* Gray varies especially in the shape and pattern of the hindwings, and in the length of the cell of these wings. I find by measurement that my series of about fifty specimens includes every modification of the hindwing, from the extremest individuals of *dasarada*, with a broad and short tail, to the smaller *philoxenus*, with shorter hindwings, longer and much more spatulate tails; and that there is also every intergradation between the specimens with a very long discoidal cell to the hindwings, and those with a broader and shorter cell. If we take the length of the hindwings = 100, the cell varies in length from 36 to 43 in my *males*, and from 32 to 39 in my *females*. In pattern of the hindwing my series shows the following variation:—

♂. (*a*²): Above, a large white patch between the discoidal veins; three submarginal red spots, of which the posterior one, situate between the lower median

nervules, is elongated, and touches the margin of the wing. Below, as above, but with a red mark at the anal angle.

(b^2): Like (a^2), but with an admarginal red spot at the end of the second median nervule.

(c^2): Like (b^2), but with the admarginal spot joined to the submarginal spot between the upper median veins.

(d^2 to f^2): Like (a^2), or (b^2), or (c^2), but with a small white spot behind the large patch below.

(g^2 to i^2): Like (d^2 to f^2), but with the additional small white spot present also on the upperside.

(h^2 to n^2): Like (g^2 to i^2), but with a second additional white spot in front of the large white mark.

(n^2 to p^2): Like (h^2 to m^2), but the spot at the apex of the tail more or less obliterated.

(q^2): The large discal mark densely shaded with black: the other markings partly small, partly absent.

(r^2 to t^2): Like (a^2 to c^2), but the first submarginal spot or all the spots more or less white.

(v^2 to x^2): Like (r^2 to t^2), but below with a white spot in front of the large white patch.

(y^2): Like (v^2), but below also with a small white mark behind the large patch.

(z^2): Like (x^2), but with the additional white spot also marked above.

♀. This sex varies just as much as the *male*; the two extreme forms are:—

(a^2): Like ♂-ab. (t^2).

(β^2): All the spots enlarged; before the usual large white patch there stands another rather large white mark; the white patch is connected with the anal angle by means of a more or less broad, pinkish white band, which is of a redder tint below than above.

The scent-organ of the *male* within the abdominal fold varies a little in shape and colour in large as well as in small individuals. If we combine the variation in pattern and shape of the hindwings with that of the *male* scent-organ, we get an enormous number of different aberrations, which cannot be grouped easily, as the variation in pattern takes place independently from that in shape or size, etc. It is, therefore, difficult to say to which of these aberrations the names of *dasarada* and *polyuctes* must be restricted; it might, perhaps, be best to sink these names altogether as mere synonyms of *philoxenus*; but as nearly all authors regard *dasarada* as a distinct species, I prefer to keep this name separate, and hence I am obliged to do so also with *polyuctes*, which is just as good (or as bad) a variety of *philoxenus* as *dasarada* is.

I personally should certainly treat both as synonyms, but the above reasons explain sufficiently my attitude.

(See above, ♂ : ab. a^2 to f^2): ab. *polyuctes* Doubl.

♂. *Papilio polyuctes* Doubleday, in Gray, *Zool. Misc.* p. 74 (1842) (Sylhet); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 15. t. 2. f. 3 (♂) (1846).

♂. *Papilio philoxenus* var. *polyuctes*, Westwood, *Cub. Or. Ent.* p. 82. t. 40. f. 3 (♂) (1848); Gray, *Cat. Lep. Ins. B. M. I.* p. 9. sub n. 31 (1852) (Sylhet); id., *List Lep. Ins. B. M. I.* p. 10. sub n. 34 (1856); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 96. sub n. 194 (1857).

♂. *Papilio philoxenus* ab. *polyuctes*, Felder, *Verh. z. b. Ges. Wien* p. 325. sub n. 477 (1864).

♂. *Papilio philoxenus ex p. auct. recent.*

♂. Hindwings with the submarginal spots red above, without a white mark before or behind the large white discal patch between the discoidal nervules.

I have not seen any *female* which has all the submarginal spots to the hindwings red on both sides.

(See above, ♂ : ab. r^2 to c^2 ; ♀ : ab. β^2): ab. *dasarada* Moore.

Papilio philoxenus var., Westwood, *Cub. Or. Ent.* p. 82, t. 40, f. 5 (♀) (1848) (Assam); Gray, *Cat. Lep. Ins. B. M.* I, p. 9, sub n. 31 (1852); id., *List Lep. Ins. B. M.* I, p. 10, sub n. 34 (1856).

Papilio dasarada Moore, in Horsf. & Moore, *Cat. Lep. Ins. Mus. F. I. C. I.* p. 96, n. 195 (1857) (Cherra Panji : no description; type of species, therefore, Westwood's fig.); Feld., *Verh. z. b. Ges. Wien* p. 325, n. 476 (1864) (Assam; Sylhet); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Oberth., *Et. d'Ent.* IV, p. 43, n. 52 (1879) ("Inde"); Stauding. & Schatz, *Exot. Schmett. I.* p. 9 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 425, n. 400 (1888) (Sikkim : probably distinct species, in Sikkim it is rarer than *philoxenus*, and is found from 1000 up to 8000 feet, and from April to November); Oberth., *Et. d'Ent.* XVII, p. 3 (1893) (Tonkin).

Papilio (Panosmia) dasarada, Wood-Mason & Nicéville, *Journ. As. Soc. Beng.* p. 374, n. 176 (1886) (Cachar : "*Panosmia*" subg. nov., nom. nud., superfl.).

Byasa dasarada, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312, n. 382 (1893) (Khasia Hills).

Papilio (Byasa) dasarada, Nicéville, *Gazetteer of Sikkim* p. 171, n. 466 (1894) (Sikkim : common, from 4000 to 8000 feet, and from April to November).

♂. The submarginal spots, at least one of them, of the hindwings more or less white.

♀. All the specimens of this sex which are not typical *philoxenus* may be treated as *dasarada*. As "typical" *philoxenus* I regard those individuals which have on the hindwings above, besides the submarginal spots, the spot at the apex of the tail, and the large white patch between the discoidal veins, a rather large white mark behind that patch.

The aberrations *polyactes* and *dasarada* occur together with typical *philoxenus* at the same elevations and at the same times of the year.

Hab. Nepal; Sikkim (31 ♂, 13 ♀); Assam (1 ♂, 1 ♀); Burma; Tenasserim; Malacca (Thaiping, 1 ♂); Shan States (7 ♂); Tonkin; North-West India.

The specimens from North-West India belong partly to this, partly to the next subspecies, or combine the characters of both.

(b): **P. philoxenus lama** Oberth. [♂, ♀].

Papilio lama Oberthür, *Et. d'Ent.* II, p. 15, t. 3, f. 1 (♀) (1876) (Moupin); id., *l.c.* IV, p. 43, n. 50 (1879) (Moupin).

Papilio philoxenus, Oberthür, *l.c.* XII, p. 14 (1886) (Tse-Ku); Lecch, *Butterfl. of China, etc.* p. 537 (1893) (exceedingly common in Central and Western China at moderate elevations; see Sikkim, Siam, Burma, etc.).

Smaller than *philoxenus* Gray; the wings are shorter and proportionally broader; the red hairs of the front of the head are rather densely intermingled with black ones; the prothorax is less red; the abdomen is black underneath, with the edges of the segments red; the large white patch on the hindwings between the discoidal veins, and the spot at the apex of the tail, are liable to obliteration.

The darkest specimens resemble *P. ulcinous menicus* Feld., but can be easily recognised by the position of the submarginal spots of the hindwings.

In the shape of the hindwings this subspecies is less variable than *philoxenus*. The *males* have sometimes the paler ground-colour of the *females*.

Hab. Central and Western China (32 ♂, 20 ♀); (probably Southern Thibet); Cashmere (1 ♀).

62. *Papilio alcinous* Klug [δ , ♀ , larva, pupa].

- δ ♀ . *Papilio alcinous* Klug, *Neue Schmett. Ins.-Samml. Berlin* t. I (δ , ♀) (1836) (Japan); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 26, t. 9, f. 13, 14 (larva, *have spec.?*) (1840) (Japan); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 9, n. 19 (1846) (*p.p.*; Japan, *nec* China); Gray, *Cat. Lep. Ins. B. M. I.* p. 12, n. 45 (1852) (Japan; *nec* "var."); id., *List Lep. Ins. B. M. I.* p. 14, n. 49 (1856) (Japan; *nec* "var."); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 95, n. 193, t. 2, f. 6 (*l.*) (1857) (Japan; *nec* "var."); Vollenhov., *Tijdschr. v. Ent.* III, p. 72, n. 12 (1860) (Japan); Feld., *Verh. z. b. Ges. Wien* p. 325, n. 479, & p. 374, n. 283 (1864) (Japan); Orza, *Lép. Japon.* p. 11, n. 8, (1869); Oberth., *Et. d'Ent.* IV, p. 42, n. 47, & p. 112, n. 47 (1879) (Japan; "Moupin and Mandchourie" *loc. err. aut subsp. alt.*); Elwes, *P. Z. S.* p. 872 (1881); Pryer, *Tr. Ent. Soc. Lond.* p. 486 (1882) (Japan; larva noticed); Stauding. & Schatz, *Exot. Schmett.* I, p. 9 (1884) (Japan); Pryer, *Rhop. Nih.* p. 4, n. 5, t. 3, f. 3 (♀) (1886) (Japan); Leech, *P. Z. S.* p. 405, n. 6 (1887) (common all over Southern and Central Japan; summer brood with longer tails); id., *Tr. Ent. Soc. Lond.* p. 115, n. 68 (1889) ("*alcinous* Klug = *mencius* Feld. = *spathatus* Butl. -- *plutonius* Oberth."); id., *Butterfl. of China*, etc. p. 539 (1893) (*p.p.*; *nec* China and Loo Choo Is.); Seitz, *Soc. Ent. X.* p. 27 (1895).
- δ ♀ . *Papilio spathatus* Butler, *Ann. Mag. N. H.* (5), VII, p. 139 (1881) (Nippon).
- δ ♀ . *Papilio haematostictus* Butler, *l.c.* p. 140 (1881) (Hakodate).

This species ranges in three subspecies over Japan (except the north), the Loo Choo Islands, China (exclusive of the southern provinces), Thibet proper, and has also been brought by native collectors [see Elwes, *Tr. Ent. Soc. Lond.* p. 424, n. 398 (1888)] from the interior of the Himalaya, probably from Bhutan. Mr. Leech recognises two distinct species in his *Butterflies of China and Japan*—*P. alcinous* Klug and *plutonius* Oberth.—and treats *mencius* Feld., *spathatus* Butl., and *haematostictus* Butl. as mere synonyms. Though I agree with Mr. Leech in respect to *spathatus* and *haematostictus*, I disagree with him in respect to *mencius* and *plutonius*. Felder's *P. mencius*, which is based upon some female examples from Ningpo, and some males without locality still preserved in the Felder collection, and the figure of the male in Gray's *Cat. Lep. Ins. B. M. I.* t. 4, f. 3 (1852), differs from *P. alcinous* Klug in the hairs of the front of the head being partly black, partly red, while in *P. alcinous* Klug the hairs of the head are invariably black. As the amount of red hairs on the head is inconstant, I think that this distinguishing character is not important enough to render it necessary to treat the Chinese *alcinous* as a distinct species; but still the difference is there, and we must regard *mencius* as a subspecies at least. To this subspecies, *P. alcinous mencius* Feld., not to typical *alcinous* Klug, belong the specimens from the Loo Choo Islands.

Oberthür's *P. plutonius* exhibits also only one character by which it is (constantly?) distinguishable from *P. alcinous*—that is, the paler colour of the underside of the hindwings; the outline of the hindwings of *plutonius* is not at all constant, and cannot serve to recognise all the specimens, which, according to the colour, belong to this form, as *plutonius*. If I treat *mencius* as a local form of *alcinous*, not as a distinct species (and I suppose all entomologists will consent), I must also regard *plutonius* as a subspecies of *alcinous*. I am quite aware that *plutonius* and *mencius* occur in the same districts of Western China; but as Mr. Elwes' collectors found *plutonius* in the interior of the Himalaya, I feel quite certain that here, as in so many cases of Thibetian and Chinese insects, the respective areas of the two forms overlap in the country west of the Yunling Mountains, a mountain range which separates Thibet proper from China; *plutonius* will certainly be found as sole form in Southern and Eastern Thibet (Kham, Minyak), just as *mencius* alone occurs in Central and Eastern China.

Thus we have to deal with three local races of the present species, namely :

(a) : *P. alcinous* Klug from Japan :

(b) : *P. alcinous menciuis* Feld. from China and the Loo Choo Islands ;

(c) : *P. alcinous plutonius* Oberth. from Western China, (Thibet), and the interior of the central and eastern parts of the Himalaya.

(a) : **P. alcinous** Klug, forma typ. [♂, ♀, larva, pupa].

I have measured a good series of specimens, and find that there is a complete gradation between the short and long-tailed individuals ; if we take the length of the forewing 100, the hindwing (from the base to the tip of the tail) has a length of from 110 to 124. Butler's *P. spathatus* with long hindwings is, therefore, not specifically distinct. According to Leech, the summer brood has longer tails than the spring brood, but this seems not to be the rule.

Front of the head black.

♂. The hindwings are either entirely black above, or possess a series of more or less distinct submarginal red spots, which vary in number from two to five. Below, the submarginal spots are red or yellow with every intergraduate tint ; the anterior one is sometimes obsolete ; the woolly scent-organ within the abdominal fold is of a blackish bistre colour (Ridgway, *Nomencl. of Colours*, pl. 3. n. 6) ; it gradually widens behind, where it has a breadth of about 5 mm.

♀. I have received from Japan only a pale form of this sex, and Leech says that the *female* is apparently constant in Japan. The submarginal spots on the underside of the hindwings are often red, or partly so.

Hab. Japan, as far north as Southern Gesso (42 ♂, 16 ♀).

(b) : **P. alcinous menciuis** Feld. [♂, ♀].

Papilio alcinous, Doubl. Westw. & Hew. (*nec Klug*, 1836), *Gen. Diurn. Lep.* I. p. 9. n. 13 (1846) ('China ; *nec Japan*) ; Oberth., *Et. d'Ent.* IV. p. 42. n. 47 (1879) ("Moupin" ; *haec subsp. v. l. plutonius* ?) ; id., *l.c.* p. 112. n. 47 (1879) ("Mandschourie," *haec subsp.?*) ; Leech, *Tr. Ent. Soc. Lond.* p. 115. n. 68 (1889) (*p.p.*) ; id., *Butterfl. of China*, etc. p. 539 (1893) (*p.p.* ; *nec Japan*).

Papilio alcinous var., Gray, *Cat. Lep. Ins. B. M. I.* p. 12. sub n. 45. t. 4. f. 3 (♂). 2 (♀) (1852) (Northern China) ; id., *List Lep. Ins. B. M. I.* p. 14. sub n. 49 (1856) (China) ; Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 95. sub n. 193 (1857) (Bhutan).

♂ ♀. *Papilio menciuis* Felder, *Wien. Ent. Mon.* VI. p. 22. n. 1 (1862) (Ningpo) ; id., *Voyh. z. b. Ges. Wien* p. 325. n. 480 (1864) (Ningpo ; Shanghai) ; Oberth., *Et. d'Ent.* II. p. 17 (1872) ; id., *l.c.* IV. p. 42. n. 48 (1879) (Moupin) ; Elwes, *P. Z. S.* p. 872 (1881) ; Stauding. & Schatz, *Exot. Schmett.* I. p. 8 (1884) (China) ; Seitz, *Soc. Ent.* X. p. 27 (1895).

All the specimens from the Continent and the Loo Choo Islands have the front of the head clothed with black and red hairs, the red ones being mostly prevailing and never absent ; all the other characters in which *menciuis* is said to differ from *alcinous* are so highly inconstant that one cannot rely upon them. The outer margin of the forewings is convex, straight, or visibly concave ; the hindwings are strongly or slightly indented, and vary in length, as in *P. alcinous* Klug, with every intergradation between the long- and short-winged individuals, at least in the *females* of my series ; the submarginal spots of the hindwings, which are never yellow, are clearly marked on the upperside in either sex, or absent, especially in the *male*. In Eastern and Central China the *female* is often of the same pale fawn-colour as that sex of *P. alcinous*, while other specimens from the same districts, and the individuals from Western China, assume the darker colour of the *male*.

Mostly the submarginal spots of the hindwings are larger than in *alcinous*, and much more arched; the spot at the anal angle below is especially large, and often penetrates into the cellule between the upper median nervules.

The scent-organ within the abdominal fold of the *male* is of the colour and shape of that of *P. alcinous*; among *mencius* occur, however, many specimens in which the abdominal fold is less extended in length and breadth, and hence the woolly patch of such specimens is narrower and shorter, and is sometimes reduced to even half the normal breadth; but what puzzles me much is the occurrence of individuals with the abdominal fold at least a fourth shorter than in ordinary examples of *mencius*—if we take the forewing = 100, the abdominal fold is about 50 in ordinary *mencius*, and only 38 in the specimens here alluded to—and with the woolly scent-organ whitish grey, not blackish brown; moreover, the scent-organ, owing to the narrowness of the abdominal fold, is almost of even breadth, which does not reach 3 mm.

According to the development of the abdominal fold, and the woolly scent-organ within it, I distinguish three forms of the *male* sex:—

(1) The abdominal fold and the scent-organ are of the same shape and colour as in *P. alcinous* Klug; there occur, however, many specimens which have the abdominal fold reduced in length and breadth, and the woolly patch shorter and narrower; sometimes the patch is of only half the normal breadth. This form agrees better with *alcinous* Klug than the following ones, but is not typical *mencius* Feld.; I call it *confusus*. To *confusus*, not to *alcinous*, belong the Loo Choo specimens.

(2) The abdominal fold is reduced; the woolly patch is not blackish brown, but greyish white. Forewings rather paler than in the preceding form. Gray's figure represents this insect; in the Felderian collection and in the British Museum are specimens of this variation only, so that we must take it for typical *mencius* Feld.

(3) The abdominal fold much more reduced than in typical *mencius*, at least a fourth shorter than in (1); if we take the forewing = 100, the abdominal fold has a length of about 50 in (1), and of 38 in the present form. The woolly scent-organ is whitish, as in *mencius*, but, owing to the narrowness of the abdominal fold, much narrower and of almost even breadth, which does not reach 3 mm. This insect I name *impediens*; the type came from Ta-t sien-lu.

In order to come to a satisfactory result about the specific distinctness or non-distinctness of these three easily recognisable forms (*mencius*, *confusus*, *impediens*), which are, to my knowledge, not connected with one another by every intergradation, we have examined the sexual organs of the *males* of *alcinous*, of the three supposed forms of *mencius*, and of *plutonium*. As I already knew from other variable species that it is quite insufficient to examine one specimen only of every form, a great number of individuals of these insects have been dissected, and the reader will learn, with the help of Plate VI. :—

(1) That the sexual organs of the *male*, especially the "harpe,"* are inconstant, if one compares a larger number of specimens of a variable species (see figs. 1-11, 12-20, 21-25, 27-30);

(2) That on the whole the black-headed (Japanese) *alcinous* Klug is different in the sexual organs from the red-headed (Chinese) *confusus* m. (see figs. 1-11, 13-20); but that there occur individuals of *alcinous* which have the organs in

* For the sake of convenience I have adopted the same names for the organs as Mr. Gosse in his paper on the clasping-organs ancillary to generation in certain groups of Lepidoptera (*Tr. Linn. Soc Lond.* (2). *Zool.* *II.* p. 265 (1883).

question as *confusus* (see fig. 11), and that there are also specimens of *confusus* in which the sexual organs are formed nearly as in *alcinous* and *plutonius* (see fig. 13);

(3) That the red-headed *confusus* from the Loo Choo Islands has the sexual organs about identical with those of *alcinous* (fig. 12);

(4) That the typical *mencius* Feld. is different from either *alcinous*, *confusus*, *impediens*, or *plutonius* (see figs. 21-25);

(5) That the harpe of *impediens*, with shorter abdominal fold and narrower hindwings, is again very different from that of typical *mencius*, *confusus*, *alcinous* Klug, and *plutonius* Oberth. (fig. 26);

(6) That the organs of the specimen of *plutonius* with white scent-organ (see *plutonius*, p. 271) are very different from the usual *plutonius* form and from *mencius*, *confusus*, etc. (figs. 31, 42);

(7) That the long-tailed *alcinous* Klug (= *spathatus* Butl.) has the same sexual organs as the short-tailed *alcinous* Klug (fig. 10).

Combining the characters derived from the sexual organs of the *male* with those derived from the shape of the wings, the colour and size of the scent-organ, and the colour of the head, we must distinguish the following forms of the *male*:—

(1) *alcinous* Klug: head black; scent-organ of *male* blackish brown; sexual organs of *male* as in figs. 1-11, 32-35.—Japan.

(2) (*confusus*, variation of): head red: the rest as before (figs. 12, 36).—Loo Choo Islands.

(3) *confusus* mihi: head red; scent-organ as before; sexual organs as in figs. 13-20, 37, 38.—All over China.

(4) *mencius* Feld.: head red; scent-organ shorter and narrower and white; scaling at the discal side of the woolly scent-organ whitish; sexual organs as in figs. 21-25, 39.—Fu-tschou, Kiu-Kiang, Chang-Yang.

(5) *impediens* m.: head as before; scent-organ still shorter and narrower, and also white; hindwings very narrow; scaling at the discal side of the woolly scent-organ blackish; sexual organs as in figs. 26, 40.—Ta-t sien-lu.

(6) *plutonius* Oberth.: head as before; scent-organ less broadened towards the

EXPLANATION OF FIGURES 1-42, PLATE VI.

Figs. 1-11. Harpe of *P. alcinous* Klug from Japan: 1 & 2, 7 & 8 respectively are right and left harpe of one individual; 10 is harpe of a large, long-tailed specimen (*spathatus* Butl.).

Fig. 12. Harpe of *confusus* m. from the Loo Choo Islands.

Figs. 13-20. Harpe of *confusus* m. from China.

Figs. 21-25. Harpe of *mencius* Feld. from China.

Fig. 26. Harpe of *impediens* m. from China.

Figs. 27-30. Harpe of *plutonius* Oberth. from China.

Fig. 31. Harpe of *fatus* m. from China.

Figs. 32-35. Uncus, scaphium, and penis of *alcinous* Klug from Japan, side view; much less variable than the harpe.

Fig. 36. The same of *confusus* m. from the Loo Choo Islands.

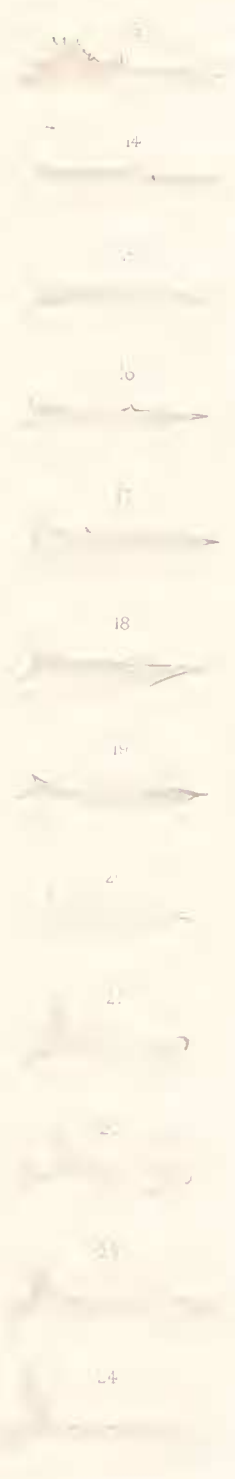
Figs. 37, 38. The same of *confusus* m. from China.

Fig. 39. The same of *mencius* Feld. from China.

Fig. 40. The same of *impediens* m. from China.

Fig. 41. The same of *plutonius* Oberth. from China.

Fig. 42. Uncus and scaphium of *fatus* m. from China; scaphium different from that of *plutonius*, *mencius*, *impediens*, *confusus*, *alcinous*.





anal angle than in *mencius* and slightly paler, broad during its whole length; hindwings deeply scalloped; tails short and broad at the tip; underside of hindwings pale; sexual organs as in figs. 27-30, 41.—Western China.

(7) *fatuus* m.: head as before; colour of hindwings as before; hindwings less scalloped; scent-organ white, shorter and narrower; sexual organs as in figs. 31, 42.—Ta-tsiens-lu.

If we compare the series of figures taken from *alcinous* and *confusus* (figs. 1-20, 32-39), there can be no doubt that the Japanese *alcinous*, the Loo Choo *confusus*, and the Chinese *confusus* belong to one species; but what do the figures tell us in respect to the insects enumerated above under 4 to 7? As the genitalia of *alcinous* and *confusus* vary to such an extent as is shown in figs. 1-20, I cannot see that the sexual organs represented in figs. 21-30 and 39-41 are anything else but also variations of the organs of the same species; they certainly do not prove that the varieties enumerated above under 4 to 6 are distinct species. We must bear in mind that out of about thirty specimens of *alcinous* only one individual has the harpe shaped as in fig. 11; that out of about thirty *confusus* also only one specimen comes in the structure of the sexual organs close to *plutonius* and *alcinous* (fig. 13); and that of numbers 4 to 6 only a relatively small number of individuals could be examined, which did not provide us (accidentally?) with intergradations. Whether *fatuus*, of which I have only one specimen, is an aberration or a distinct species must be left undecided. We come, therefore, to the same conclusion to which we were led without comparison of the genitalia, namely, that all the insects in question are most probably forms of one species only.

The Loo Choo insect, combining the characters of *alcinous* and *mencius*, remains best without a name of its own; *confusus* and *impediens* have to stand as aberrations of *mencius*, and *fatuus* may be treated for the present as an aberration of *plutonius*.

As regards the *female* sex of the Chinese insect in question, it is difficult to say which specimens must be mated with *mencius*, which with *confusus* or *impediens*.

I thought first that *mencius*, *confusus*, and *impediens* might be seasonal forms of one species; but this is not possible, at least as regards *mencius* and *confusus*, as I have both from Kiu-Kiang and Fu-tschou, taken in April and July at either place.

Hab. China (64 ♂, 39 ♀): Loo Choo Islands (2 ♂).

(c): **P. alcinous plutonius** Oberth. [♂, ♀].

♂. *Papilio alcinous* var., Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 95. sub n. 193 (1857) (Bhutan).

♂ ♀. *Papilio plutonius* Oberthür, *Et. d'Ent.* II. p. 16. n. 3. t. 3. f. 2 (♂) (1876) (Moupin); id., *l.c.* IV. p. 42. n. 49 (1879) (Moupin); Elwes, *Tr. Ent. Soc. Lond.* p. 424. n. 398 (1888) (Bhutan?); Leech, *Butterfl. of China*, etc. p. 511 (1893) (W. China).

♂ ♀. *Papilio alcinous*, Leech, *Tr. Ent. Soc. Lond.* p. 115. n. 68 (1889).

♀. *Papilio* (? *Byasa*) *plutonius*, Nicéville, *Gazetteer of Sikkim* p. 171. n. 463 (1894) (Bhutan?).

Papilio (? *Byasa*) *alcinous*, id., *l.c.* p. 171. n. 464 (1894) (Bhutan).

The wings are above of a stronger greenish glossy tint than in *mencius* Feld., and the hinder wings are paler below than in both *mencius* and *alcinous*, especially in the *female*. The forewings are rather broader, the hindwings more deeply indented, with the tails shorter, broader, and more spatulate. The scent-organ of the *male* within the abdominal fold of the posterior wings is paler and narrower than in typical

mencius and *alcinous*, but much broader and darker than in *mencius* ab. *impediens* mihi.

Though these characters apply to most specimens, they are not at all constant, except the paler underside of the hindwings, which I find in all examples.

(a^2) : ab. *fatuus* ab. nov.

Margin of hindwings less scalloped than in typical *plutonius*; woolly scent-organ whitish, shorter and narrower than in *plutonius*; genitalia as in figs. 31 and 42.

One specimen of this aberration, from Ta-t sien-lu, in my collection.

Hab. Western China (7♂, 8♀) : Thibet; interior of Bhutan (1♀, ex coll. Möller; it is one of the two specimens recorded by Mr. Elwes, *l.c.*).

V. MACHAON-GROUP.

This group is especially richly represented in America.

63. *Papilio machaon* L. [♂, ♀, metam.].

- Hoefnagel, *Archetypa* t. 11 (1592); Aldrovandus, *De Anim. Ins.* p. 96. n. 5. 6. f. 1 (1602); Columna, *Eph.* II. p. 85-89. t. 86 (1616); Hoefnagel, *Ins.* I. t. 9 (1630); Mouffet, *Theatr. Ins.* p. 99. n. 2 (1634); Jonston, *Hist. Nat. Ins.* t. 5. 7 (1657); Merrett, *Pinar ver. not. Brit.* p. 198 (1667); Jung, *Hist. Vermium* p. 134 (1691); Petiver, *Mus.* VIII. p. 35. n. 328 (1709); Rajus, *Hist. Nat. Ins.* p. 110. n. 1 (1710); Frisch, *Beschreib. v. Ins.* II. p. 41. n. 11 (1721); Merian, *Ins. Eur.* p. 13. t. 38 (1730); Réaumur, *Mém.* I. 1. p. 357. t. 10. f. 6. & I. 2. p. 179. t. 29. f. 9. & t. 30. f. 1-13 (1734); Roessel, *Insect. Beust.* I. 2. t. 1 (1746); Wilkes, *Engl. Moths & Butt.* p. 47. t. 1 (1747-60); Degeer, *Mém.* (ed. Goetze) I. p. 57 (1758); id., *Mém.* II. p. 185. t. 1. f. 2 & 3 (1771); Geoffroy, *Mém. Ins. Paris* II. p. 54. n. 23 (1762); Gronov, *Zoophyl.* p. 725 (1763-81); Seba, *Thesaur.* IV. p. 39. t. 32. f. 7-10. & p. 70. t. 59. f. 12. 13 (1765); Schaeffer, *Icon. Ins. Ratisb.* t. 45. f. 1. 2 (1766); Lapechin, *Tagebuch* (ed. Haase) I. p. 197 (1771).
- Papilio Equus Achirus machaon* Linné, *Syst. Nat.* ed. x. p. 462. n. 27 (1758); Poda, *Mus. Grass.* p. 61. n. 1 (1761); Scopoli, *Ent. Carn.* p. 166. n. 444 (1763); Houttuyn, *Naturl. Hist.* I. 11. p. 206. n. 27 (1767); Linné, *Syst. Nat.* ed. xii. p. 750. n. 33 (1767); Müller, *Naturs.* V. 1. p. 575. n. 33. t. 15 (l.) (1774); Fabricius, *Syst. Ent.* p. 452. n. 42 (1775); Ebert, *Naturl. t.* 35. f. 1-4 (1776); Esper, *Eur. Schmett.* I. p. 31. t. 1. f. 1 (1777); Fischer, *Vers. Nat. v. Livland* p. 145. n. 315 (1778); Harris, *Aurel.* p. 70. t. 36 (1778); Blumenb., *Handb. Naturg.* ed. II. p. 357. n. 3. (1782); Gladb., *Beschr. neuer Schmett.* p. 80. t. 36. f. 7-9 (1777); Fabricius, *Spec. Ins.* p. 3. n. 9 (1781); Gesenius, *Handb. f. Schmett.* p. 50. n. 1 (1786); Fabricius, *Mant. Ins.* p. 2. n. 9 (1787); Jablonsky & Herbst, *Naturs. Schmett.* III. p. 162. t. 45. f. 1 & 2 (1788); Villers, *Carol. Linn. Entom.* II. p. 3. n. 2 (1789); Fabricius, *Ent. Syst.* III. I. p. 30. n. 87 (1793); Cederhielm, *Faun. Ingr. Prodr. Ins.* p. 201 (1798); Hübner, *Europ. Schmett.* I. f. 390 & 391 (1798-1803).
- Papilio machaon* Linné, *Fauna Succ.* ed. ii. p. 267. n. 103 (1761); Fuesslin (Fuessly), *Vers. Schweiz. Ins.* p. 28. n. 543 (1775); id., *Mag. f. Liebh. Ent.* I. p. 245 (1778); Walcken., *Faune Paris.* II. p. 261. n. 2 (1802); Latreille, *Hist. Nat. Crust. Ins.* XIV. p. 109. t. 106. f. 1 (1805); Godart, *Hist. Nat. Léop. Fr.* I. p. 38. t. 1. f. 2 (1821); Duponchel, *Icon. Chén. Fr.* I. p. 41. t. 1. f. 2 (1832-36); Boisduval, *Spec. Gén. Léop.* I. p. 328. o. 171 (1836); Selys-Longch., *Cat. Léop. Belg.* p. 15 (1837); Gaze, *Entomologist*, p. 307 (1840); id., *l.c.* p. 340 (1840) (Haverhill, England); Blanchard, *Hist. Nat. Ins.* III. p. 421. n. 6 (1840); Duponchel, *Cat. Méth. Léop. d'Eur.* p. 21 (1844); Lucas, *Léop. d'Eur.* ed. ii. p. 24. t. 13. f. 1 (1845); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 16. n. 158 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. Brit. Mus.* I. p. 37. n. 180 (1852) (*p.p.*); Westw., *Bull. of Gt. Brit.* p. 3. n. 1. t. 1. f. 1. Ia. 1b (1854); Lucas, *Chenu's Enc. d'Hist. Nat., Pup.* p. 36. f. 112 & 113 (1851-53) (larv. & pup.); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 111. n. 224 (1857) (*p.p.*); Rambur, *Léop. d'Andalousie* p. 59. n. 21 (1858); Speyer, *Geogr. Verh. Schmett. Eur.* p. 278. n. 2 (1858); Praun, *Eur. Tugf. Pap.* XI., *Pap.* t. 1. f. 1. 2 (1859); Huell, *Tijdschr. v. Ent.* p. 131. t. 7. f. 1-4 (1859) (var. larv.); Verloren, *ibid.* p. 90 (1859) (Utrecht); id., *l.c.* p. 22 (1860); Fritsch, *Verh. z. b. Ges. Wien* pp. 238. 240. 642 (1862); Snellen, *Tijdschr. v. Ent.* p. 173. n. 1 (1862) (Zuid Holland); Grasslin, *Ann. Soc. Ent. Fr.* p. 331 (1863) (Pyrén. or.); Felder, *Verh. z. b. Ges. Wien* p. 314 n. 357 (1864); Lederer, *Ann. Soc. Ent. Belg.* p. 53 (1865) (Anatolia); Mann, *Verh. z. b. Ges. Wien* p. 325 (1866) (Dobrukscha); Maurissen, *Tijdschr. v. Ent.* p. 171 (1866) (Maastricht);

- White, *Ent. Mo. Mag.* p. 57 (1867) (Rome; Capri); Allard, *Ann. Soc. Ent. Fr.* p. 312 (1867) (Algérie); Ebrard, *Bull. Soc. Ent. Fr.* p. 67 (1867) (col. of pupa); Mann, *Verh. z. b. Ges. Wien* p. 66 (1867) (Militär-Grenze); id., *l.c.* p. 832 (1867) (Bozen; Trient); Fettig, *Bull. Soc. Ent. Fr.* p. 63 (1868) (col. of pupa); Mann, *Verh. z. b. Ges. Wien* p. 373 (1869) (Dalmatien); Butler, *Cat. Diurn. Lep. Fabric.* p. 249. n. 51 (1869); Heylarts, *Tijdschr. v. Ent.* p. 143. n. 1 (1870) (Breda); Lederer, *Ann. Soc. Ent. Belg.* p. 18 (1870) (Transcaucasia); Ebrard, *Bull. Soc. Ent. Fr.* p. 8 (1870) (col. of pupa); Bishopp, *Entom.* p. 17 (1870) (Ipswich); Brooks, *ibid.* p. 346 (1870) (Dewsmere); Fallou, *Bull. Soc. Ent. Fr.* p. 54 (1871) (col. of pupa); id., *l.c.* p. 55 (1872) (col. of pupa); Raynor, *Entomol.* p. 223 (1872) (Maldon); Backer, *Tijdschr. v. Ent., Versl.* p. 23 (1875); Parker, *Entomol.* p. 301 (1875); Pagenstecher, *Verh. Nat. Ver. Heidelberg* p. 96. n. 12 (1875); Swierstra, *Tijdschr. v. Ent., Versl.* p. 104 (1876); Elwes, *Tr. Ent. Soc. Lond.* p. 389 (1887) (Pyr., up to 5000 feet); Mills, *Entomol.* p. 191 (1877) (Essex); Farn, *ibid.* p. 252 (1877) (Kent); Goos, *ibid.* p. 285 (1877) (Sussex); Cooper, *ibid.* p. 299 (1877) (Kent); Walker, *Ent. Mo. Mag.* p. 193 (1879) (Pt. Backler, Turkey; April, gen. I.; July, gen. II.); Rambouts, *Tijdschr. v. Ent., Versl.* p. 18 (1879); Swinton, *Ent. Mo. Mag.* p. 40 (1879) (Capri, July); Jordan, *ibid.* p. 87 (1879) (Zermatt, June & July); Oberthur, *Et. d'Ent.* IV. p. 68. n. 192 (1879) (*p.p.*); Wilson, *Larr. of Brit. Lep.* p. 1. t. 1. f. 1 (1880); Mann, *Entomol.* p. 66 (1881) (Bristol); Mathew, *Ent. Mo. Mag.* p. 29 (1881) (Turkey); Malpas, *ibid.* p. 110 (1881) (Norfolk Fen); Buckler, *ibid.* p. 244 (1881); Porritt, *ibid.* p. 119 (1882) (Wicken Fen); Wheeler, *ibid.* p. 169 (1884) (Norfolk); Seton, *Ent. Mo. Mag.* p. 141 (1884) (Surrey); Calberla, *Iris* p. 121 (1884) (Mittel Italien); Romanoff, *Mém. Léop.* I. p. 43 (1884) (Transcaucasia); Christoph., *ibid.* p. 93 (1884) (Askhabad); Goossens, *Bull. Soc. Ent. Fr.* p. 181 (1885) (life hist.); Buckler, *Larr. of Brit. Butt. & Moths* p. 1. t. 1. f. 1. Ia-f (1886); Jacoby, *Ent. Mo. Mag.* p. 88 (1886) (Herne Bay); Bath, *ibid.* p. 126 (1886); Jones, *ibid.* p. 182 (1886) (Switzerland); Kane, *ibid.* p. 245 (1886); Cuisine, *Bull. Soc. Ent. Fr.* p. 103 (1886) (var.); Poulton, *P. Z. S.* p. 208 (1887); Ficksen, Romanoff's *Mém. Léop.* III. p. 255. n. 4 (1887) (Korea); Walker, *Ent. Mo. Mag.* p. 179 (1887) (Gibraltar, October!); Barrett, *ibid.* p. 79 (1888) (*occurrence in Engl.*); Jones, *ibid.* p. 209 (1888) (France mér.); Jackson, *Entomol.* p. 89 (1888) (var.); Graeser, *Biol. Ent. Zeit.* p. 61. n. 1 (1888) (Amur); Alpheraky, *Rom. Mém. Léop.* V. p. 60. n. 1 (1889); id., *l.c.* p. 94. n. 1 (1889) (Gau-szu); Voigt, *Stett. Ent. Zeit.* p. 23 (1890) (Granada; *an subsp. sphyrus?*); Bramson, *Tugfalter* p. 12 (1890); Hofmann, *Raup. d. Schm. Eur.* p. 1. t. 1. f. 2 (1890); Steinert, *Iris* IV. p. 175 (1891) (Dresden); Reuter, *Ent. Nachr.* p. 6 (1891) (col. of pupa); Standing., *Rom. Mém. Léop.* VI. p. 128. n. 1 (1892) (Amur); Austant, *Le Natural.* p. 13 (1892); Barrett, *Lep. Brit. Is.* p. 13. n. 1 (1892); Nicholson, *Entomol.* p. 210 (1893) (Budapest); Standen, *ibid.* p. 261 (1893) (Corsica!); Bromilow, *ibid.* p. 347 (1893) (Alpes mar.); Caradja, *Iris* VI. p. 169 (1894) (Haute Garonne); Heyne & Rühl, *Grossschmettl.* p. 695 (1895).
- Papilio reginae* Retzius, *Gen. Spec. Ins.* p. 30. n. 5 (1783).
- Pieris machaon*, Schrank, *Fauna Boica* II. 1. p. 16 (1801).
- Jasonides machaon*, Hübner, *Verz. bkl. Schmettl.* p. 83. n. 843 (1816).
- Amaryssus machaon*, Dalman, *Kongl. Vet. Acad. Holm.* 37. p. 85 (1816).
- Papilio machaon* var. *watckai* Garbowsky, *Soc. Ent. V.* p. 154 (1892) (*monstr.*); Ruhl, *Grossschmettl.* p. 82 (1892).

This widely distributed *Papilio* is rather variable, especially in the amount of black on the wings. If we omit the American forms, which I cannot take into consideration in the present paper, there remain four subspecies of *P. machaon*, namely:—

- (a): *P. machaon* L., forma typ. in Central Europe as far north as Southern Sweden, and in Transcaucasia;
- (b): *P. machaon sphyrus* Hübn. in South Europe, North Africa, England, Asia Minor, and Cashmere;
- (c): *P. machaon sikkinensis* Moore in the interior of Sikkim and Blutan, in Thibet and West China; Shan States;
- (d): *P. machaon hippocrates* Feld. in Eastern China and Japan.

Papilio machaon has, in most places, two or three broods, which are more or less different *inter se*; in Europe the summer brood has the black bands on the wings more restricted than the spring brood, while the black colour is very much increased in the summer brood of the Japanese race.

(a) : *P. machaon* L., forma ty]. [♂, ♀, metam.].

It is possible that I have missed some varietal names of *P. machaon*, as a good number of local lists contained in programmes of German high schools were not accessible to me.

(a²) : ab. *marginalis* Robbe.

Papilio machaon var. *marginalis* Robbe, *C. R. Soc. Ent. Belg.* p. 395 (1891) (Belgium).

Black bands of the wings much reduced. Fringe to the outer margin of the forewings not black at the ends of the veins : submarginal spots of the same wings oblong, not lunate ; outer margin of the hindwings not dentate. Underside of both wings paler yellow than in typical *P. machaon*.

Certainly not confined to Belgium.

(b²) : ab. *nigrofasciatus* Rothke.

Papilio machaon L. ab. n. *nigrofasciatus* Rothke, *Stett. Ent. Zeit.* IV. p. 303 (1895) (Crefeld).

Papilio machaon ab. *nigrofasciatus*, Heyne, in Rühl, *Grossschmett.* p. 694 (1895).

The submarginal yellow spots on the upperside of the wings very much reduced ; anal ocellus half blue, half black, the red portion reduced to a minute linear spot at the anal angle.

This curious form is probably not confined to the surroundings of Crefeld.

(c²) : ab. *niger* Heyne (Reuter in manuscr.).

Papilio machaon ab. *niger* Heyne, in Rühl, *Grossschmett.* p. 694 (1895) (Baden).

All black, except the blue spots of the hindwings.

(d²) : ab. gen. aest. *aurantiacus* Speyer.

Papilio machaon var. *aurantiaca* Sélys, *Ann. Soc. Ent. Fr.* p. 4. sub n. 2 (1831) (Belgium : nom. nud.!) : Speyer, *Geogr. Verbr. Schmett.* p. 278. sub n. 2 (1858) ; Donck., *Feuille d. Jeun. Nat.* p. 34. f. 1 (Janvier 1881) ; Capronn., *C. R. Soc. Ent. Belg.* p. 42 (1881) ; Standen, *Entomol.* p. 261 (1893) (Corsica!).

Papilio machaon var. *burdigalensis* Trimonlet, *Cat. Lép. Gironde* p. 10 (1859) ; Breignet, *Bull. Soc. Ent. Fr.* p. 143 (1890).

Papilio machaon var., Pagenstecher, *Verh. Nat. Ver. Heidelberg* p. 98. n. 13 (1875).

Papilio machaon ab. (var. gen. II.?) *drusus* Fuchs, *Stett. E. Zeit.* p. 21 (1884) (Rheingau).

Papilio machaon var. *centralis* Staudinger, *Stett. E. Zeit.* p. 193 (1886) ; Christoph, *Rom. Mém. Lép.* V. p. 2. n. 2 (1889) ; Groum-Grschmailo, *ibid.* IV. p. 140 (1890) ; Heyne, in Rühl, *Grossschmett.* p. 694 (1895).

Papilio machaon var. *centralis*, Christoph, *Rom. Mém. Lép.* III. p. 51 (1887) (*laps. typ.?*).

Papilio machaon ab. *aurantiaca*, Astant, *Le Naturaliste* p. 15 (1892).

Upperside of the wings of a deeper yellow colour than in the first brood ; the black bands narrower, abdominal margin to the hindwings often more or less devoid of black ; abdomen (chiefly in the *female*) with the dorsal black band more or less obliterated.

The summer brood is neither in every year nor in every locality different from the spring brood. Mostly the number of specimens of the second brood exhibiting the characters of ab. *aurantiacus* is small in Central Europe.

Hab. Europe, except England and the north and the extreme south (7 ♂, 7 ♀). In Asia Minor, Transcaucasia, Central Asia, and South Europe some specimens belong to *sphyrus*, others to typical *machaon*.

(b): *P. machaon sphyrus* Hübn. [♂, ♀, metam.].*

- Papilio sphyrus* Hübn., *Europ. Schmett.* I. t. 155. f. 775. 776 (1818-27) (*Patria?*).
- Papilio machaon* var. *sphyrus*, Speyer, *Geogr. Verbr. Schmett. Eur.* p. 278. sub n. 2 (1858): Verloren, *Tijdschr. v. Ent.* p. 100 (1859); Minà-Palumba e Failla-Tedaldi, *Natural. Sicil.* p. 20 (1889) (Sicilia).
- Papilio machaon*, Lucas, in Chenu's *Enc. d'Hist. Nat., Pap.* p. 30. t. 105 (1851-53); Gray, *Lep. Ins. Nepal* p. 6. t. 3. f. 1 (1846); Hutton, *Tr. E. Soc. Lond.* p. 47 (1847); Lucas, *Bull. Soc. E. Fr.* p. 5 (1864); Lang, *Ent. Mo. Mag.* p. 101 (1864) (N.W. Himal., 6000 to 10,000 feet); Stoliczka, *Verh. z. b. Ges. Wien* p. 866 (1866) (N.W. Himal.).
- Papilio machaon* var. *saharæ* Oberthür, *Et. d'Ent.* IV. p. 68. sub n. 192 (1879) (Algérie, Laghouat); Heyne, in Rühl, *Grossschmett.* p. 694 (1895).
- Papilio machaon* var. *asiatica* Ménétrics, *Enumer. Corp. Anim. Mus. Petr.* I. p. 70 (1855) (p.p.); Doh. *Journ. As. S. Beng.* p. 136. n. 222 (1886) (Kumaon); Butler, *Ann. Mag. N. H.* (6). I. p. 205. n. 94 (1888) (N.W. India); Alphéraky, *Rom. Mém. Léop. V.* p. 60. sub n. 1 (1889); Heyne, in Rühl, *Grossschmett.* p. 694 (1895).
- Papilio machaon* var., Kollar, in Hugel's *Kaschmir IV.* 2. p. 404 (1848).
- Papilio asiatica* Moore, *P. Z. S.* p. 258 (1882); Butler, *P. Z. S.* p. 377. n. 83 (1886).
- Papilio machaon* ab. *sphyrus*, Astant, *Le Naturalist* p. 23 (1892); Heyne, in Rühl, *Grossschmett.* p. 694 (1895).
- Papilio machaon* var. *hospitonoides* Oberthür, *Et. d'Ent.* XII. p. 21. t. 5. f. 19 (1888) (*the name is based upon an aberration of the larva!*).

The black bands broad; the submarginal band to the hinder wings, upperside, often almost touching the discoidal cell.

(a²): ab. *ladakensis* Moore.

Papilio ladakensis Moore, *Journ. As. S. Beng.* p. 46 (1886).

Tails very short.

The Asiatic specimens of *machaon* agree so well with Sicilian, North African, and English examples that I cannot separate them subspecifically from *sphyrus*; they form often a connecting link between *sphyrus* and *hippocrates* in having the submarginal black band to the underside of the hindwings rather much constricted between upper median nervules, a character which is strongly pronounced in *hippocrates*.

Ménétrics (*l.e.*) distinguishes his *P. machaon* var. *asiatica* from European *machaon* only by the broader black bands of the wings, and gives as habitat of this form "Himalaya and Kantschatka." Alphéraky (*l.e.*) has already pointed out that Ménétrics's variety cannot be identical with the form described as *sikkimensis* by Mr. F. Moore; as the "hab." Himalaya stands first, the name of *asiaticus* must be restricted to Himalayan individuals, and as it cannot be referred to the examples from the Central Himalayas, which are *sikkimensis*, it has to be united to the North-West Himalayan specimens; from this latter country specimens of *machaon* have long been known, whereas the Central Himalayan form (which certainly flies also in the eastern parts of the Himalayas, which are practically unknown) has been discovered only twelve years. The *P. machaon* from the North-West Himalayas and Cashmere is, however, in most cases indistinguishable from the Mediterranean *machaon*, *i.e.* from *sphyrus* Hübn., and so I am forced to sink *asiaticus* Mén. as a synonym to *sphyrus* Hübn.

The most pronounced *sphyrus* occur in certain parts of North Africa.

The specimens with the tails to the hindwings more or less obliterated (ab.

* For the bibliography of the English *P. machaon sphyrus* see *P. machaon*.

(*ladakensis* Moore) are most abundant in the North-West Himalayas, where they fly together with long-tailed individuals.

Hab. England (4 ♂, 2 ♀); South Europe (4 ♂, 4 ♀); North Africa (2 ♂): Western Asia, including Cashmere and the north-west parts of Central Asia (28 ♂, 11 ♀).

(c): ***P. machaon sikkimensis*** Moore [♂, ♀].

Papilio machaon var. *asiatica*, Nicéville (nec Ménétriés, 1855), *Journ. As. S. Beng.* p. 93 (1883).

Papilio sikkimensis Moore, *Journ. As. S. Beng.* p. 47 (1884).

Papilio machaon, Elwes, *Tr. E. Soc. Lond.* p. 437. n. 435 (1888) (not found in Brit. Sikkim; occurs probably only in the higher, dryer hills of the interior); Leech, *Bull. of China*, etc. p. 516 (*p.p.*) t. 35. f. 2 (1893); Nicéville, *Gazetteer of Sikkim* p. 175. n. 504 (1894) (Sikkim; at high elevations in the interior: July, August).

(?) *Papilio machaon*, Nicéville, *Journ. Bombay N. H. Soc.* p. 387. n. 91 (1890) (Chin-Lushai); Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 199 (1891) (Shan States; not uncommon at 4000 feet, more rarely at 3000 feet).

Papilio machaon var. *sikkimensis*, Heyne, in Rühl, *Grossschmett.* p. 694 (1895).

Black bands broad. Orange spot of anal mark to hindwings separated from the blue lunule in front of it by means of a black semicircle; orange spot often as small as in *P. hospiton* Géné. Submarginal black band to hindwings on underside usually not bordered with orange at its discal side.

Hab. Central Himalayas (7 ♂, 1 ♀); Western China (8 ♂); Kukumor (1 ♂); Shan States (the same?).

The individuals of *P. machaon* from the higher parts of Western China belong to *sikkimensis*; those from the valleys and from Central and Eastern China combine the characters of *sphyrus*, *sikkimensis*, and *hippocrates*, and come often very near to typical *machaon*. The Chinese summer brood, chiefly in Eastern China, is mostly the same as *hippocrates*; the specimens of the spring brood are of the size of our European *machaon*, but they have the submarginal black band on underside of hindwings always much more narrowed between the upper median nervules than true *machaon*.

(d): ***P. machaon hippocrates*** Feld. [♂, ♀, metam.]

Papilio machaon var., De Haan, *Verh. Nat. Ges. Ned. overz. bez., Zool.* p. 42. t. 5. f. 4 (1840)

Papilio hippocrates Felder, *Verh. z. b. Ges. Wien* p. 314. n. 356. & p. 362. n. 201 (1864); Butl., *Ann. Mag. N. H.* (5). IX. p. 19. n. 34 (1882) (Yokohama); Butl., *l.c.* (5). XI. p. 113. n. 18 (1883) (Corea).

Papilio machaon Orza, *Lep. Jap.* p. 11. n. 9 (1867); Pryer, *Tr. E. Soc. Lond.* p. 486 (1882); id., *Rhop. Nihon.* p. 3. n. 1. t. 1. f. 1A. 1B (1886); Leech, *Bull. of China*, etc. p. 516 (1893) (*p.p.*).

Papilio machaon var. *micado* Pagenstecher, *Verh. Nat. Ver. Heidelberg* p. 98. n. 15 (1875).

Papilio machaon var. *hippocrates*, Elwes, *P. Z. S.* p. 870 (1881) (*p.p.*: N.E. Asia & Japan); Heyne, in Rühl, *Grossschmett.* p. 694 (1895).

Papilio machaon var. *asiatica* & *hippocrates*, Leech, *P. Z. S.* p. 404 (1887) (*larva noticed*).

Papilio machaon ab. *hippocrates*, Auctant, *Le Naturaliste* p. 31 (1892).

Spring brood: differs from *P. machaon* and its varieties in having the submarginal black band on the underside of the hindwings very narrow, except in the cellule between the lower median nervules, where it is comparatively very broad, and in having both edges of this band strongly bordered with black. Upperside of the wings mostly of the dark yellow tint of *P. machaon* ab. *aurantiacus* Speyer.

Summer brood (or broods): typical *hippocrates*. Very large. Both sexes have the orange anal spot on the hindwings separated from the blue lunule before it by a black semicircle, as in *P. machaon sikkimensis* Moore. *Males* generally of the colour of the spring brood, but with the black bands on the upperside broader,

submarginal black band to the hindwings often reaching the discoidal cell. *Females* blacker than *males*; discal yellowish area on the upperside of the hindwings often reduced to a rather narrow macular band.

Submarginal black band on the underside of the hindwings narrow in both sexes, and heavily bordered with black.

Hab. Japan (44 ♂, 18 ♀); Central and Eastern China (15 ♂, 3 ♀).

61. *Papilio hospiton* Gén  [♂, ♀, metam.].

Papilio hospiton G n , *M m. Accad. Turin*, p. 43, t. 2, f. 20, 21 (1839); Herrich-Sch ff., *Schm. Eur.* I, p. 140, t. 53, f. 249, 250 (1843-56); Duponchel, *Cat. M th. L p. d'Eur.*, p. 21 (1844); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 16, n. 159 (1846); Gray, *Cat. Lep. Ins. Brit. Mus.* I, p. 37, n. 181 (1852); Felder, *Verh. z. b. Ges. Wien*, p. 314, n. 355, & p. 362, n. 199 (1864); Mabille, *Bull. Soc. Ent. Fr.*, p. 89 (1868) (Bastia); Fallou, *ibid.*, p. 55 (1872); Oberth r, *Et. d'Ent.* IV, p. 68, n. 193 (1879); Bramson, *Tagf.*, p. 13 (1890); Hofmann, *Ramp. d. Schm. Eur.*, p. 1, t. 6, f. 2 (1890); R hl, *Grossschmett.*, p. 83 (1892); Hofmann, *Schm. Eur.*, ed. ii, p. 1, t. 1, f. 4 (1893); Standen, *Entom.*, p. 238 (1893) (June 15th, Tattone); Heyne, in R hl, *Grossschmett.*, p. 694 (1895).

Eques hospiton, Herr.-Sch ff., *l.c.* I, p. 162 (1843-56).

Especially different from *P. machaon* in the pattern of the marginal region on the underside of both wings. Larva also different from that of *P. machaon*.

Hab. Corsica and Sardinia (6 ♂, 4 ♀).

65. *Papilio polidamas* Prun. [♂, ♀, metam.].

Papilio Eques Achirus polidamas Prunner, *Lep. Pedem. Suppl.*, p. 69, n. 134 (1798).

Papilio polygramm Deloche, *M m. Accad. Tur.* VI, 2, p. 139, t. 6, n. 1 (1801).

Papilio Eques Achirus alexanor Esper, *Eur. Schm.* I, Suppl., p. 89, t. 110 cont. t. 65, f. 1 (1805); Hubn., *Eur. Schmett.*, t. 158, f. 787, 788 (1818-27).

Jasmiodes alexanor, H bner, *Verz. bek. Schmett.*, p. 82, n. 842 (1816).

Papilio alexanor Godart, *Enc. M th.* IX, p. 56, n. 88 (1819); id., *Hist. Nat. L p. Fr.* II, p. 10, t. 1 (1822); Duponch., in Godart's *Hist. Nat. L p. Fr. Suppl.* I, p. 12 (1832); id., *Icon. d. Chen. Fr.*, p. 42, t. 1, f. 3 (1832-36); Boisd., *Spec. G n. L p.* I, p. 329, n. 172, t. I, A, f. 3 (*d. p.*); t. I, B, f. 3 (1736); Blanch, *Hist. Nat. Ins.* III, p. 422, n. 7 (1840); Doubl. *Gen. Diurn. Lep.* I, p. 16, n. 156 (1846); Lucas, in Chenn's *Enc. d'Hist. Nat., Pap.*, p. 38, f. 115 (1851-53); Gray, *Cat. Lep. Ins. Brit. Mus.* I, p. 37, n. 179 (1852); Gu rin, *Bull. Soc. Ent. Fr.*, p. 73 (1856); Chavignerie & Gu rin, *ibid.*, p. 82 (1856); Chavign., *ibid.*, p. 100 (1857); Praun, *Eur. Tagf. Pap.* XI, *Papilio* t. 1, f. 5, 6 (1859); Felder, *Verh. z. b. Ges. Wien*, p. 314, n. 352, & p. 361, n. 195 (1864); Lucas, *L p. d'Eur.*, ed. ii, p. 24, t. 13, f. 2 (1864); Lederer, *Ann. Soc. Ent. Belg.*, p. 53 (1865) (Anatolia); Mabille, *Bull. Soc. Ent. Fr.*, p. 15 (1875) (Hendaye); Oberth., *Et. d'Ent.* IV, p. 67, n. 187 (1879); Christoph, *Rom. M m. L p.* V, p. 2, n. 1 (1889) (Ashkhabad); Bramson, *Tagf.*, p. 13 (1890); Hofmann, *Ramp. d. Schm. Eur.*, p. 1, t. 6, f. 1 (1890); R hl, *Grossschmett.*, p. 80 (1892); Hofmann, *Schmett. Eur.*, ed. ii, p. 1, n. 2, t. 1, f. 2 (1892); Heyne, in R hl, *Grossschmett.*, p. 693 (1895) (*larva noticed*).

I restore the oldest name to this species (cf. p. 168), which has developed into two geographical forms:—

(a): ***P. polidamas*** Prun., forma typ. [♂, ♀, metam.].

Hab. South Europe (11 ♂, 8 ♀).

(b): ***P. polidamas orientalis*** Rom.

Papilio alexanor var. *orientalis* Romanoff, *Rom. M m. L p.* I, p. 41, t. v, f. 1 (1884) (S.E. Caucasus); R hl, *Grossschmett.*, p. 81 (1892); Heyne, *ibid.*, p. 693 (1895) (*gives erroneously Christoph instead of Romanoff as author of this subspecies*).

Band at the apex of the cell and the submarginal band on the forewings suffused with blue; submarginal band to the hindwings posteriorly more strongly dilated than in *P. polidamas* Prun.; basal black band of both wings narrow.

As aberration of this local form we have to enumerate the following insect :

(α^2) : *ab. maccabaicus* Stauding.

Papilio alexanor var. *maccabaicus* Standinger, *Iris* IV. p. 224 (1891) (Jerusalem).

Papilio alexanor var. *judaicus* Staudinger, *l.c.* VI. p. 369 (1893) (*renamed*).

Black bands of the wings broader than in *orientalis*, chiefly the basal one.

It is possible that *maccabaicus* is the spring brood and *orientalis* the summer brood of the same subspecies.

Hab. Asia Minor, Palestine, Transcaucasia (2 ♂, 2 ♀).

66. *Papilio xanthus* L. [♂, ♀, metam.]

Papilio Eques Achirus xanthus Linné, *Syst. Nat.* ed. xii. p. 751. n. 34 (1767) ("Ind. or." *loc. err.* : in indice sub nom. "*xanthus*" *enum.*).

Papilio Eques Achirus xanthus, Müller, *Naturs.* V. 1. p. 576. n. 34 (1774) ("Ostindien" *loc. err.*) ; Fabr., *Syst. Ent.* p. 454. n. 47 (1775) ; Cramer, *Pap. Ex.* I. p. 115. t. 73. f. A. B (1776) (China) ; Goeze, *Ent. Beytr.* III. 1. p. 60. n. 34 (1779) ; Fabr., *Spec. Ins.* II. p. 19. n. 75 (1781) ; Jabl. & Herbst, *Naturs. Schm.* III. p. 202. n. 115. t. 49. f. 3. 4 (1788) (China) ; Gmelin, *Syst. Nat.* I. 5. p. 2239. n. 34 (1790) ("India" *err. loc.*) ; Fabr., *Ent. Syst.* III. 1. p. 32. n. 92 (1793) ("Ind. or." *loc. err.*).

Papilio Eques Achirus xanthus, Fabricius, *Mant. Ins.* II. p. 10. n. 86 (1787).

Jasmiades xanthus, Hubner, *Verz. bek. Schm.* p. 83. n. 845 (1816).

Papilio xanthus, Godart, *Enc. Méth.* IX. p. 58. n. 90 (1819) ; Boisdu, *Icon. Hist. Léop. d'Eur.* t. 1. f. 1. 2 (1832) ; Lucas, *Lép. Ex.* p. 36. t. 19. f. 1 (1835) ; Boisdu, *Spec. Gén. Léop.* I. p. 327. n. 170 (1836) (China : Thibet ; Persia : Siberia) ; De Haan, *Verh. Nat. Gesch. Ned. overz. lcz.* p. 41. t. 9. f. 12 (larv.) (1840) ; Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 16. n. 157 (1846) (China ; Siberia : "N. India & N.W. Australia" *loc. err.*) ; Gray, *Cat. Lep. Ins. B. M. I.* p. 36. n. 178 (1852) ("Port Essington" *loc. err.*) ; id., *List Lep. Ins. B. M. I.* p. 49. n. 186 (1856) ("var. a. Port Essington" *loc. err.*) ; Horsf. & Moore, *Cat. Lep. Ins. Mus. E. J. C. I.* p. 111. n. 223. t. 4. f. 1 (larv.) (1857) ("N. India" *loc. err.*) ; Vollenhov., *Tijdschr. v. Ent.* III. p. 84. n. 120 (1860) (Japan) ; Feld., *Verh. z. b. Ges. Wien* p. 314. n. 353. & p. 362. n. 198 (1864) ; Orza, *Lép. Jap.* p. 11. n. 10 (1869) ; Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 248. n. 50 (1869) ; id., *P. Z. S.* p. 814. n. 36 (1877) (Formosa, common) ; Jones, *Entomol.* p. 97 (1877) (*xanthus* reared from eggs of *xanthus*) ; Oberth., *Et. d'Ent.* IV. p. 69. n. 200 (1879) (China ; Askold I.) ; Elwes, *P. Z. S.* p. 870 (1881) (N.E. Asia) ; Pryer, *Tr. Ent. Soc. Lond.* p. 186 (1882) (Japan) ; Butl., *Ann. Mag. N. H.* (5). XI. p. 113. n. 19 (1883) (Corea) ; Pryer, *Rhop. Nihonica* p. 3. n. 2. t. 1. f. 2a. 2b (1886) (Japan : *xanthus* = summer form, *xanthulus* = spring form) ; Leech, *P. Z. S.* p. 404. n. 2 (1887) (Japan & Corea) ; Fixsen, *Rom. Mén. Léop.* III. p. 255. n. 3 (1887) (Korea) ; Leech, *Tr. Ent. Soc. Lond.* p. 115. n. 70 (1889) (Kiu Kiang) ; Alphéraky, *Rom. Mén. Léop.* V. p. 94. n. 2 (1889) ; Stauding, *ibid.* VI. p. 128. n. 2 (1892) ; Leech, *Bull. Ent. of China*, etc. p. 514 (1893) (Amur : Japan : Corea : China) ; Seitz, *Stett. Ent. Zeit.* LV. p. 335. n. 1 (1895).

Papilio xanthus var., Butler, *Ann. Mag. N. H.* (5). XI. p. 278. n. 4 (1883) (Corea).

Linné described this *Papilio* under the name of *xanthus* in *Syst. Nat.* ed. xii., in the index of which work he enumerated it, however, as *xanthus*, probably because he saw that he had already used the name of *xanthus* for a *Papilio Danaus Festivus* ; all authors have adopted the name of *xanthus*, and I cannot find a single reference to the first name *xanthus*. As the *Papilio Danaus Festivus xanthus* L. is an *Opsiphanes*, I see no objection to accept the name of *xanthus* for the present species of the genus *Papilio*.

Papilio xanthus L. is very variable both in size and pattern. The orange mark at the anal angle of the hindwings above, which is present in many specimens, is micolorous, or it has a black centre, as we shall see again in some other species of the *machaon*-group inhabiting North America.

The spring brood is very small, and the yellowish white colour of the wings is more extended than in the summer broods:—

(*a*²): ab. gen. vern. *xanthulus* Brem.

Papilio xanthulus Bremer, *Bull. Ac. Pet.* III. p. 463 (1861); id., *Lepid. Ost-Sib.* p. 4. n. 4. t. 1. f. 2 (1864); Feld., *Verh. z. b. Ges. Wien* p. 314. n. 354 (1864); Oberth., *Et. d'Ent.* IV. p. 69. n. 201 (1879); Butl., *Ann. Mag. N. H.* (5). XI, p. 113. n. 20 (1883) (Corea).

Papilio xanthulus Murray, *Ent. Mo. Mag.* p. 166 (1874) (Yokohama).

Papilio xanthus, Pryer, *Rhop. Nihon.* p. 3. n. 2 t. 1. f. 2a (1885).

There is no longer any doubt that this is really the spring brood of *xanthus*, as the latter has been reared from the eggs of *xanthulus*. Intermediate specimens between *xanthus* and *xanthulus* are common.

(*b*²): ab. gen. aest. *xanthus* L.

Hab. China (35 ♂, 18 ♀); Formosa; Amur (6 ♂); Corea; Japan (39 ♂, 24 ♀).

Boisduval records it also from Persia; this locality is probably erroneous. I have also a specimen said to be from Bonin Island.

Note.—*Papilio antinous* Don., *Ins. of New Holl.* t. 16 (1805), is the same as *P. eurymedon* Boisd., *Ann. Soc. Ent. Fr.* p. 280 (1852); it has, of course, never been found in New Holland. Compare also Macleay, *Tr. Ent. Soc. N.S. Wales*, I. p. xxii. (1863).

67. *Papilio demoleus* L. [♂, ♀, metam.]

Ehret, *Plant. ac Pap. var. dep.* t. 5 (1748-59) (India); Knorr, *Dolic. Nat. t. c. 5. f. 1* (1751); Kleemann, *Beitr.* I. p. 13. t. 1. f. 2. 3 (1761); Gronovius, *Zoophytl.* II. p. 188. n. 723 (1763-8) (India); Seba, *Thes.* IV. p. 53. t. 45. f. 8. 9 (1765) (China).

Papilio Eques Achivus demoleus Linné, *Syst. Nat.* ed. x. p. 464. n. 35 (1758) (Asia); Clerck, *Icon. Ins.* III. t. 6. f. 1 (1764); Houtt., *Nat. Hist.* I. 11. p. 217. n. 35 (1767) (China); Müller, *Naturs.* V. 1. p. 579. n. 46 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 455. n. 53 (1775) (*p.p.*); Goeze, *Ent. Beytr.* III. 1. p. 68. n. 46 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 21. n. 87 (1781) (*p.p.*); Gmelin, *Syst. Nat.* ed. xiii. I. 5. p. 2246. n. 46 (1790); Fabr., *Ent. Syst.* III. 1. p. 34. n. 101 (1793) (*p.p.*); Esper, *Ausl. Schmett.* p. 201. n. 92. t. 50. f. 1 (*l.*). 2 (*p.*). 3 (*♂*). 4 (*♀*) (1797) (*bad figs. of larva & pupa*).

Papilio Eques Achivus erithonius Cramer, *Pap. Ecot.* III. p. 67. t. 232. f. A. B (1782) (China; Coromandel); Jablonsky & Herbst, *Naturs. Schm.* III. p. 109. n. 84. t. 36. f. 5. 6 (1788).

Papilio Eques Achivus epinus Fabricius, *Ent. Syst.* III. 1. p. 35. n. 102 (1793) (China).

Papilio epinus, Donovan, *Ins. of China* t. 28. f. 2 (♂) (1798); Godart, *Enc. Méth.* IX. p. 43. n. 53 (1819); (*p.p.*) Boisd., *Spec. Gén. Lép.* I. p. 238. n. 61 (1836) (China; Bengal); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 34 (1840); Doubl., *List Lep. Ins. B. M. I.* p. 7 (1845); Templeton, *Tr. Ent. Soc. Lond.* V. p. 44 (1847) (*sexual difference noted*); Vollenhov., *Tijdschr. v. Ent.* III. p. 77. n. 52 (1860) (China); Koch, *Indo-Austral. Lep. Fauna* p. 41 (1865) (*p.p.*); Bienert, *Lep. Erg. Pers.* p. 26 (1869) (Persien); Oberth., *Et. d'Ent.* XYII. p. 6 (1893) (Tonkin).

♀. *Papilio demoleus*, Donovan, *Ins. of China* t. 28. f. 1 (1798).

Princeps Dominans erithonius, Hubner, *Exot. Schm.* I. t. 117 (1806-16).

Orpheides epinus, Hübner, *Verz. bek. Schmett.* p. 86. n. 887 (1816).

♂. *Papilio demoleus*, Thon, *Naturg. Schmett.* p. 18. t. 6. f. 19 (1837).

♂ ♀. *Papilio erithonius*, Doubl. Westw. & Hlew., *Gen. Diurn. Lep.* I. p. 12. n. 71 (1846); Gray *Cat. Lep. Ins. B. M. I.* p. 21. n. 92 (1852) (N. India; Ceylon; *see* Penang); id., *List Lep. Ins. B. M. I.* p. 28. n. 99 (1856) (N. India; Ceylon; *see* Penang); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 105. n. 211. t. 3. f. 6 (*l.*). 6a (*p.*) (1857) (Canara; Calcutta; *see* Penang); Feld., *Verh. z. b. Ges. Wien* p. 309. n. 281. & p. 356. n. 163 (1864); Laug, *Ent. Mo. Mag.* p. 101 (1864) (N.W. Himal.); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 59. n. 84 (1865); Chaum., *Ent. Mo. Mag.* p. 37 (1865) (Centr. India, everywhere); Alex., *ibid.* p. 208 (1865) (Sangor, Centr. India); Moore, *P. Z. S.* p. 487 (1865) (N.W. Himal.); id., *loc.* p. 757 (1865); Wall. & Moore, *ibid.* p. 356 (1866) (Formosa); Butl., *Cat. Diurn. Lep. descr. Fabric.*

- p. 245. n. 41 (1869) ; id., *P. Z. S.* p. 727 (1870) ; Druce, *ibid.* p. 108. n. 2 (1874) (Siam) ; Butl., *ibid.* p. 814. n. 35 (1877) (Formosa) ; Oberth., *Et. d'Ent.* IV. p. 57. n. 120 (1879) (China : Cochin China : India) ; Butl., *P. Z. S.* p. 669 (1880) (Formosa) ; Elwes, *ibid.* p. 873 (1881) (N.E. Asia) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XIX. 5. p. 34. n. 33a (1882) (Recensio Lep. Mus. L. V.) ; Forsayeth, *Tr. Ent. Soc. Lond.* p. 386 (1884) (life hist.) ; Butl., *Jour. Mag. N. H.* (5). XVIII. p. 189. n. 50 (1885) (Upp. Burma) ; Elwes, *Tr. Ent. Soc. Lond.* p. 429. n. 414 (1888) (Sikkim, only in the outer hills) ; Butl., *l.c.* (6). I. p. 205. n. 93 (1888) (N.W. Ind.) ; Davids & Aitk., *Journ. Bombay N. H. Soc.* p. 366. n. 71 (1890) (Bombay Presid., metam.) ; Manders, *Tr. Ent. Soc. Lond.* p. 536 (1890) (Shan States, very common at low elevations) ; Watson, *Journ. As. Soc. Beng.* p. 268 (1890) (Madras, March to August, very common) ; id., *Journ. Bomb. N. H. Soc.* p. 54 (1891) (Chin-Lushai) ; Woodrow, *ibid.* p. 114 (1891) (caterp. enemy of orange-trees) ; Betham, *ibid.* p. 328 (1891) (life hist.) ; Leech, *Butt. of China*, etc. p. 554 (1893) (Foochau).
- ♂. *Papilio epius*, Hutton, *Tr. Ent. Soc. Lond.* V. p. 48. n. 4 (1847) (Madras ; larva noticed).
- ♀. *Papilio demoleus*, Hutton, *l.c.* n. 5 (1847) (Dhoon).
- ♂(?) ♀. *Papilio erithonius* var. *demoleus* Oberthür, *Et. d'Ent.* IV. p. 57. sub n. 129 (1879) (China). *Orpheides erithonius*, Moore, *Lep. of Ceylon* I. p. 147. t. 61. f. 2 (1881) (Ceylon) ; id., *P. Z. S.* p. 258 (1882) (N.W. Himal.).
- Papilio (Orpheides) erithonius*, Nicéville, *Journ. As. Soc. Beng.* p. 51. n. 128 (1885) (Calcutta, common) ; Doherty, *ibid.* p. 137. n. 231 (1886) (Kumaon) ; Wood-Mas. & Nicév., *ibid.* p. 377 n. 192 (1886) (Cachar) ; Elwes & Nicév., *ibid.* p. 438. n. 147 (1886) (Tavoy) ; Hamps., *ibid.* p. 363 (1886) (Nilgiris, 1000 to 7000 feet) ; Fergus., *Journ. Bomb. N. H. Soc.* p. 446 (1891) (Travancore) ; Nicév., *Gazetteer of Sikkim* p. 173. n. 482 (1894) (Sikkim : rare, at low elevations).
- Ophreides (sic!) erithonius*, Swinhoe, *ibid.* p. 145. n. 137 (1885) (Bombay & Deccan, common everywhere) ; id., *l.c.* p. 432. n. 95 (1886) (Mhow) ; *Tr. Ent. Soc. Lond.* p. 314. n. 400 (1893) (Khasia Hills).
- Ophreides (sic!) erithonius*, Swinhoe, *Journ. Bomb. N. H. Soc.* p. 279 (1887) (Carachi).

This species is very common in Western India ; it becomes rarer farther east, and in Borneo, Sumatra, and Java it has not yet been found ; from Flores to Queen-land it is again fairly common, at least not a rarity, and Mr. Wallace has also found it on Goram Island in the Southern Moluccas. Reakirt, *Tr. Ent. Soc. Phil.* p. 472 (1864), records it from the Philippines, but this locality is most probably erroneous. Leech's collectors did not meet with it in China, though it occurs there ; Leech himself found one specimen in Foochau.

The proper name of this *Papilio* is *demoleus* L. The description of *demoleus* in *Syst. Nat.* ed. x. (1758) applies to the Asiatic species, not to the African *Papilio* which all recent authors consider the true *demoleus* L., and so do the figures to which Linné refers ; the patria "Asia" is also in favour of my opinion. In *Mus. Lud. Ulr.* (1764) Linné describes unmistakably the African *Papilio* as *demoleus*, and omits in the description those characters of the first description in *Syst. Nat.* (1758) which do not fit the African insect ; he also does not refer again to the figures quoted in *Syst. Nat.* ; as patria he gives here "Cap. b. spei." Most probably Linné described the Asiatic insect from the figures of Ehret, etc., not from a specimen of the insect itself, and confounding it afterwards with the African butterfly in the Museum of the Queen Ludovica Ulrica, described this latter *Papilio* under the same name, probably believing that Ehret's, etc., figures were partly erroneous in pattern.

Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XIX. p. 34 (1882), comes to the same conclusion, that Linné first described the Asiatic *Papilio* as *demoleus* ; but he thinks it unnecessary to make an alteration in the present nomenclature of the two *Papilios*, because the name of *demoleus* L. has been applied so long a time by all authors to the African species. But is it not much better to correct a fault as soon as possible ? It is certainly quite unsatisfactory to call the Asiatic species *P. erithonius* Cram. if

one knows that this is not its proper name: and so I must satisfy myself by naming the Asiatic insect *P. demoleus* L.; the African species has to stand as *P. demodocus* Esp. [*Ausl. Schmett.* p. 205. t. 51. f. 1 (1798)].

Four subspecies belong to *P. demoleus* L. :—

- (a) : *P. demoleus* L. from India, Ceylon, China;
- (b) : *P. demoleus malayanus* Wall. from Malay Peninsula, Hainan;
- (c) : *P. demoleus sthenelinus* subsp. nov. from the lesser Sunda Islands;
- (d) : *P. demoleus sthenelus* MacLeay from Northern Australia and South New Guinea.

The differences between the four geographical forms are but slight.

Wallace (*Tr. Linn. Soc. Lond.* XXV. p. 59) records *sthenelus* from Goram Island; I have not seen a specimen from that locality.

In all local races of *P. demoleus* L. the *females* are distinguished from the *males* by having the red anal mark of the hindwings emarginate anteriorly, and in possessing a blue lunule in front of it; sometimes this character is also found in the *male*, but in a less degree.

(a) : **P. demoleus** L., forma typ. [♂, ♀, metam.].

Oberthür, *Et. d'Ent.* IV. p. 57 (1879), describes his *P. erithonius* var. *demoleinus* as having a black spot and blue lunule before the red anal mark of the hindwings. As said before, this character is always present in the *female*, and sometimes in the *male*, from all localities; if one will maintain that varietal name, it must be restricted to such examples of the *male* sex.

Hab. From Persia and Cashmere to Ceylon and the Shan States, at lower elevations (28 ♂, 7 ♀); China (5 ♂, 2 ♀); Formosa.

(b) : **P. demoleus malayanus** Wall. [♂, ♀].

Papilio erithonius, Gray (*nec* Cramer, 1782), *Cat. Lep. Ins. B. M.* I. p. 21. n. 92 (1852) (*p.p.* : Penang); *id.*, *List Lep. Ins. B. M.* I. p. 28. n. 99 (1856) (*p.p.* : Penang); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 105. n. 211 (1857) (*p.p.* : Penang); Wallengr., *Wien. Ent. Mon.* VII. p. 65. n. 3 (1863) (Malacca); Reak., *Proc. Ent. Soc. Phil.* p. 472. n. 19 (1864) (*p.p.* : "Philippines" *loc. err.*).

Papilio erithonius local form *a* (*malayanus*) Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 59. sub n. 81 (1865) (Singapore; "Manila" *loc. err.*; *nec* Flores).

Papilio malayanus Butler, *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 552. n. 8 (1877) (Malacca); Moore, *P. Z. S.* p. 697 (1878) (Hainan).

Papilio erithonius var. *malayanus*, Distant, *Rhop. Mal.* p. 350. n. 14. t. 27b. f. 6 (1885) (Malay Pen.); Holland, *Tr. Amer. Ent. Soc. Phil.* XIV. p. 123. n. 75 (1887) (Hainan; apparently excessively common in Hainan).

Orpheides malayanus, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 50 (1889) (Mergui).

The transverse band of the hindwings is broader within the cell than in typical *P. demoleus*, so that it is less deeply sinuate at the end of the cell.

Hab. Malay Pen. (6 ♂, 4 ♀); Hainan (*the same?*).

Whether the Hainan *demoleus* belong to this form or to the typical race I do not know. The "*hab.*" Philippines (see Reakirt, *l.c.*) is certainly erroneous.

(c) : **P. demoleus sthenelinus** subsp. nov. [♂, ♀].

Papilio erithonius local form *a* (*malayanus*) Wallace, *l.c.* p. 59. sub n. 81 (1865) (*p.p.* : Flores).

Papilio erithonius, Snellen (*nec* Linné, 1758), *Tijdschr. v. Ent.* XXXIV. p. 250. n. 47 (1891) (Flores); Röber, *ibid.* p. 276 (1891) (Flores; Alor); Pagenst., *Jahrb. Nass. Ver. Nat.* p. 57 (1894) (Sumba).

Papilio (*Orpheides*) *erichthonius*, Doherty, *Journ. As. Soc. Beng.* p. 191. n. 107 (1891) (Sumba; Sambawa).

Forewings shorter than in *sthenelus* MacLeay, with a large mark within the cell as in that subspecies; between the fourth and fifth subcostal nervules there is, beside the submarginal spot, only one spot, the exterior one of the two innermost being obliterated; sometimes this spot is indicated by some yellowish scales.

The red anal mark of the hindwings is on both sides (♀), or only below (♂), more restricted; above, the small discal spots near the end of the cell are absent; below, the posterior buffish marginal markings are small, the black spots of the interior discal series are large: one row of blue spots.

Hab. Alor (type; W. Doherty, October 1891; 3 ♂, 1 ♀); Larentuka (W. Doherty, October 1891; 3 ♂); Adonara (W. Doherty, November 1891; 2 ♂); Flores; Sambawa; Sumba; Goram (*the same?*).

(d): ***P. demoleus sthenelus* MacLeay** [♂, ♀, metam.].

Papilio sthenelus MacLeay, in King's *Surr. Austr.* II. p. 457 (1827) (Australia); Boisd., *Sp. Gén. Léop.* I. p. 239. n. 62 (1836); Feld., *Verh. z. b. Ges. Wien* p. 309. n. 282 (1864) (Australia); Butl., *Aun. Mag. N. H.* (4). XVIII. p. 248. n. 28 (1876) (Pt. Moresby); Standing & Schatz, *Exot. Schmett.* I. p. 20 (1884); MacLeay, *Proc. Linn. Soc. N.S. Wales* p. 1019 (1887) (King's Sound); Scott, *Austr. Lep.* II. I. 30. t. 20 (1899) (larv., pup.).

Papilio erithonius var. *sthenelus*, Donbl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. sub n. 71 (1816) (Australia); Gray, *Cat. Lep. Ins. B. M.* I. p. 21. sub n. 92 (1852) (Australia); id., *List Lep. Ins. B. M.* I. p. 28. sub n. 99 (1856) (Australia); Oberth., *Et. d'Ent.* IV. p. 57. sub n. 129 (1879) (Southern N. Guinea).

Papilio erithonius local form *b* (*sthenelus*), Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 60. sub n. 81 (1865) (p.p.; Australia).

Papilio epius, Koch, *Indo-Austral. Lep. Fauna* p. 41 (1865) (p.p.).

Papilio erithonius, Mathew, *Proc. Linn. Soc. N.S. Wales* p. 263 (1885) (Thursday I.); id., *Tr. Ent. Soc. Lond.* p. 169 (1888) (Pt. Moresby; life hist.).

Transverse band of the hindwings almost as in *malayanus*; the two spots within the apex of the cell of the forewings merged together.

Hab. North Australia (1 ♂, 1 ♀); Thursday Island (3 ♂); British New Guinea (11 ♂, 4 ♀). The New Guinea examples approach *P. demoleus sthenelinus* subsp. nov.

VI. HELENIUS-GROUP.

The outer region of the upperside of the forewings is in the *male* sex hairy. The hairs stand so densely as to conceal the scaling.

68. *Papilio demolion* Cram. [♂, ♀, metam.].

Papilio Eques Achivus demolion Cramer, *Pap. Exot.* I. p. 140. t. 89. f. A. B (1776) (Java); Goeze, *Ent. Beytr.* III. I. p. 79. n. 33 (1779); Jablonsky & Herbst, *Naturs. Schmett.* III. p. 199. t. 49. f. 1. 2 (1788).

Papilio Eques Achivus cresphontes Fabricius (*acc* Cramer, 1779), *Spec. Ins.* II. p. 19. n. 77 (1781) (Ind. or.); id., *Mant. Ins.* p. 10. n. 88 (1787); Gmelin, *Syst. Nat.* ed. xiii. 5. I. p. 2240. n. 322 (1890); Fabr., *Ent. Syst.* III. I. p. 33. n. 95 (1793).

Heclaides cresphontes, Hubner, *Verz. bek. Schm.* p. 84. n. 854 (1816).

Papilio cresphontes, Godart, *Enc. Méth.* IX. p. 61. n. 98 (1819); Horsf., *Cat. Lep. Ins. Mus. E. I. C.* I. t. 3. f. 4 (l.). 4a (p.). (1828) (Java); Zink., *Nor. Act. Av. Nat. Cur.* XV. p. 159. n. 13 (1831) (Java); Lucas, *Lep. Ex.* p. 23. t. 15. f. 1 (1835) (Java); Boisd., *Spec. Gén. Léop.* I. p. 220. n. 38 (1836) (Java; Borneo; *see* "Celebes"); Lucas, in Chemu's *Enc. d'Hist. Nat., Pap.* t. 1. f. 1 (1851); Vollenhov., *Tijdschr. v. Ent.* III. p. 75. n. 54 (1860) (Java; Sumatra; Borneo).

Papilio demolion, Donbl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 13. n. 94 (1816) (Java; Borneo; "Burmah" *loc. err.?*); Gray, *Cat. Lep. Ins. B. M.* I. p. 25. n. 116 (1852) (Java; Borneo; Penang; Moulmein); id., *List Lep. Ins. B. M.* I. p. 34. n. 123 (1856); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 105. n. 210. t. 3. f. 5 (l.). 5a (p.) (1857); Feld., *Verh. z. b. Ges.*

Wien p. 318. n. 392. & p. 366. n. 231 (1864) ("Ind. sept.!!"; Sumatra: Borneo: Moulmein: Malacca; Penang; *occ* Ceylon); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 59. n. 79 (1865) (Java; Borneo; Sumatra; Singapore; Moulmein acc. to B. M.); Butl., *Cat. Dourn. Lep. descr. Fabric.* p. 253. n. 61 (1869); Druce, *P. Z. S.* p. 108. n. 3 (1874) (Siam); Butl., *Tr. Linn. Soc. Lond.* (2). *Zool.* 1. p. 552. n. 9 (1877) (Mal. Pen.); Oberth., *Et. d'Ent.* IV. p. 58. n. 131 (1879) (Java); Stauding. & Schatz, *Exot. Schm.* 1. p. 7 (1884); Kheil, *Rhop. Nias* p. 37. n. 139 (1884) (Nias); Dist., *Rhop. Mal.* p. 349. n. 13. t. 27b. f. 3 (♂) (1885) (Mal. Pen.: Borneo); id. & Pryer, *Ann. Mag. N. H.* (5). XIX. p. 273. n. 173 (1887) (Sandakan); Stauding., *Iris* I. p. 277 (1888) (Palawan); id., *l.c.* II. p. 11 (1889) (Palawan); Hagen, *Berl. Ent. Zeit.* XXXVII. p. 154. n. 171 (1892) (Banka); Semper, *Philipp., Tagfalt.* p. 274 note (1892) (Palawan); Hagen, *Iris* VII. p. 26. n. 26 (1894) (Sumatra).

Araminta demolion, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 50 (1889) (Mergui I.).

This species has a peculiar range; it flies in the large Sunda Islands, Palawan, Malay Peninsula, Tenasserim, and Siam, and appears again, as a slightly different local form, in South India; Doubleday records it from Burma, Felder from North India, but these localities are doubtless erroneous; we have no authentic record of the insect from Burma, North India, Bengal, Central Provinces, etc.

(a): **P. demolion** Cram., forma typ. [♂, ♀, metam.].

In a *female* from Nias there are on the underside of the forewings some submarginal spots posteriorly which form a kind of ill-defined narrow band, reminding one of the corresponding spots of *P. gigon* Feld. Sometimes there are two spots between the fourth and fifth subcostal veins of the forewings instead of one.

Hab. Java (4 ♂, 1 ♀); Nias (5 ♂, 1 ♀); Sumatra (4 ♂); Malay Peninsula (18 ♂); Siam (1 ♂, 1 ♀); Borneo (3 ♂); Palawan (1 ♀).

(b): **P. demolion liomedon** Moore.

Papilio liomedon Moore, *P. Z. S.* p. 575 (1874) (Calicut, Malabar Coast); Hamps., *Journ. As. Soc. Beng.* p. 364. n. 212 (1888) (Nilgiris, 2500 feet, September); Davids. & Aitk., *Journ. As. Soc. Beng.* p. 367. n. 75. t. D. f. 1. 2. 3 (*l., p.*) (1890) (Bombay Presid.; life hist.); Fergus., *Journ. As. Soc. Beng.* p. 446. n. 183 (1891) (Travancore).

The posterior spots of the macular band of the forewings are distinctly separated from one another. The band of the hindwings stands farther from the base than in *P. demolion* Cram.; in a Nias specimen of the latter the band has, however, the same position as in certain *P. demolion liomedon* Moore. The hairs of the forewings are sometimes arranged in patches, almost as in *P. ulysses* L., *bianor* Cram., *peranthus* Fabr., etc.

Hab. South India (4 ♂).

Felder, *Verh. z. b. Ges. Wien* p. 318. n. 392 (1864), records *P. demolion* from Ceylon; if *P. demolion* really occurs there, the specimens belong undoubtedly to *P. demolion liomedon* Moore.

69. **Papilio gigon** Feld. [♂, ♀].

Papilio cresphontes, Boisduval (*occ* Fabr., 1781), *Spec. Gén. Léop.* I. p. 229. n. 38 (1836) (*p.p.*: Celebes).

Papilio gigon Gray, *List Lep. Ins. B. M.* 1. p. 27. n. 96 (1856) (Celebes; *nom. nud.*!); Felder, *Verh. z. b. Ges. Wien* p. 318. n. 391. & p. 366. n. 230 (1864) (Celebes); id., *Reise Novara, Lep.* 1. p. 98. n. 75. t. 12. f. a. b (♂) (1865) (Celebes); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 59. n. 80. t. 7. f. 6 (1865) (Celebes; Sula Is.); Hopfl., *Stett. Ent. Zeit.* p. 29. n. 12 (1874) (Celebes & Siao Is.); Piepers & Snell., *Tijdschr. v. Ent.* XXI. p. 39. n. 155 (1878) (Celebes; is var. of *demolion* Cram.); Oberth., *Et. d'Ent.* IV. p. 58. n. 130 (1879) (Celebes); Stauding. & Schatz, *Exot. Schm.* 1. p. 7. t. 3 (♂) (1884); Holland, *Proc. Boston Soc. N. H.* p. 77. n. 127 (1890) (S. Celebes); Haase, *Untersuch. üb. Mim.* p. 39 (1893).

Besides many differences in pattern, the greater size, and the much more arched costal margin of the forewings, *P. gijon* Feld. is distinguished from *P. demolion* Cram. by the totally differently shaped cell of the hindwings, which at once shows that *P. gijon* Feld. cannot be considered a variety of *P. demolion* Cram., as Snellen (*l.c.*) suggests.

The veins traversing the band of the forewings are black above, like the rest of the wing, except the submedian nervure, which is in most examples partly of the colour of the band. On the hindwings above there is often a rather large spot between the subcostal and upper discocellular nervules, especially in the *females*.

The submarginal spots on the underside of the forewings are very variable; they are often joined to one another and form a zigzag band.

Hab. Celebes (14 ♂, 3 ♀); Sula Islands; Mangola (1 ♂, 1 ♀); Siao Islands; Sangir Island (1 ♀); Talaut Island (2 ♂).

70. *Papilio antonio* Hew. [♂, ♀].

Papilio antonio Hewitson, *Exot. Batt. V., Pap.* t. 14. f. 46 (♂, upperside) (1875) (Mindanao); Haase, *Untersuch. üb. Mim.* p. 39 (1893).

Papilio (Araminta) antonio, Semper, *Philipp., Tagfalt.* p. 274. n. 400. t. 47. f. 4 (♂, underside) (1892) (♂, ♀; Mindanao).

The median band of the hindwings of *P. demolion* Cram. is in *P. antonio* Hew. indicated above at the abdominal margin by a white spot; sometimes there is another spot between the lower median nervules. On the underside of the forewings the triangular mark is continued towards the apex of the wing by some minute white spots. In the *female* the white mark of the forewings is longer than in the *male*.

Hab. Mindanao (3 ♂).

71. *Papilio noblei* Nicév. [♂].

♂. *Papilio noblei* Nicéville, *Journ. As. Soc. Beng.* p. 287. n. 19. t. 13. f. 2 (♂) (1888) (Karen Hills, Burma); Semp., *Philipp., Tagfalt.* p. 275. sub n. 400 (1892); Haase, *Untersuch. üb. Mim.* p. 40 (1893).

♂. *Papilio henricus* Oberthür, *Et. d'Ent.* XVI. p. 3. t. 4. f. 39 (♂) (1893) (Mouong-Mou, Tonkin).

Differs from *P. antonio* Hew. chiefly in the white triangular mark of the forewings being obliterated.

According to the figures, *P. henricus* Oberth. is the same as *P. noblei* Nicév.; a few slight differences in the figures are certainly individual.

Hab. Burma; Tonkin.

72. *Papilio helenus* L. [♂, ♀, larva, pupa].

Ehret, *Plant. ac Pap.* t. 10 (1748-59).

Papilio Eques Trajanus helenus Linné, *Syst. Nat.* ed. x. p. 459. n. 4 (1758) (Asia); Clerck, *Icon. Ins.* 1. t. 13. f. 2 (1759); Linné, *Mus. Lud. Utr.* p. 185. n. 4 (1764) (Ind. or.); Houtt., *Nat. Hist.* I. 11. p. 191. n. 4. t. 87. f. 1 (underside) (1767) (China); Linné, *Syst. Nat.* ed. xii. p. 745. n. 4 (1767); Mull., *Naturs.* V. 1. p. 567. n. 4. t. 17. f. 1 (1774) (China); Fabr., *Syst. Ent.* p. 443. n. 5 (1775) (*p.p.*); Cramer, *Pap. Ec.* II. p. 90. t. 153. f. A. B (1777) (China); Goeze, *Ent. Beytr.* III. 1. p. 39. n. 4 (1779) (*excl. cit. Sebau*); Fabr., *Spec. Ins.* 11. p. 3. n. 7 (1780) (*p.p.*); Esper, *Insul. Schmett.* p. 18. n. 4. t. 2. f. 2 (1784); Jablonsky, *Naturs. Schm.* 11. p. 166. n. 40. t. 14. f. 4 (♂) (1781); Fabr., *Mant. Ins.* II. p. 1. n. 3 (1787) (*p.p.*); Gmelin, *Syst. Nat.* ed. xiii. I. 5. p. 2226. n. 4 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. 1. p. 2. n. 3 (1793) (*p.p.*).

Papilio helenus, Godart, *Enc. Méth.* IX. p. 68. n. 117 (1819) (China); Boisdu, *Spec. Gén. Léop.* I. p. 211. n. 25 (1836) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 57 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 18. n. 77 (1852) (N. India; China); id., *List Lep. Ins. B. M.* I. p. 25. n. 81 (1856) (*syn. p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 101. n. 205

- (1857) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 404 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 50. n. 56 (1865) (*p.p.*); Moore, *P. Z. S.* p. 757 (1865); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 254. n. 64 (1869) (*p.p.*); id., *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 553. n. 13 (1877) (Mal. Pen.); Moore, *P. Z. S.* p. 696 (1878) (Hainan); id., *loc. cit.* p. 840 (1878) (Hatsiega); Nicéy., *Journ. As. Soc. Beng.* p. 59 (1881) (Sikkim, October); Elwes, *P. Z. S.* p. 873 (1881); Auriv., *Kongl. Sc. Vet. Ak. Hand.* XIX. 5. p. 10. n. 4 (1882) (*Linné's type-spec. preserv. in Mus. Stockholm*); Stauding. & Schatz, *Exot. Schm.* I. p. 7 (1884); Butl., *Ann. Mag. N. H.* (5). XV. p. 344. n. 110 (1885) ("near Assam"); Dist., *Rhop. Mal.* p. 343. n. 8. t. 29. f. 3 (♂) (1885) (*p.p.*); Holland, *Tr. Amer. Ent. Soc. Phil.* XIV. p. 123. n. 78 (1887) (Hainan); Elwes, *Tr. Ent. Soc. Lond.* p. 429. n. 411 (1888) (Sikkim; one of the commonest species of *Papilio* up to 5000 or 6000 feet); Davids. & Aitk., *Journ. Bombay N. H. Soc.* p. 367. n. 74 (1890) (Bombay Presid.; larva & pupa; *hatec* subsp. ?); Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 191 (1890) (Shan States, abundant); Leech, *Bull. of China*, etc. p. 548 (1893) (*p.p.*); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin).
- Chares* (sic *l*) *helenus*, Swinhoe, *P. Z. S.* p. 145. n. 143 (1885).
- Papilio* (*Charus*) *helenus*, Doherty, *Journ. As. Soc. Beng.* p. 137. n. 236 (1886) (Kumaon); Elwes & Nicéy., *ibid.* p. 436. n. 135 (1886); Watson, *Journ. Bomb. N. H. Soc.* p. 54 (1891) (Chin-Lushai); Nicéy., *Gazetteer of Sikkim* p. 172. n. 478 (1894) (Sikkim; probably the commonest *Papilio* in Sikkim, up to 6000 feet).
- Charus helenus*, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 51 (1889) (Owen I., Mergui Archip.); Swinhoe, *Tr. Ent. Soc. Lond.* p. 312. n. 384 (1893) (Khasia Hills; apparently rare!).

Linné's type came from India or China, which localities are inhabited by the same race.

P. helenus L. ranges over the whole of Continental India, Ceylon, Burma, Siam, Malacca, China (excl. of the north), Southern Japan and the Loo Choo Islands, Philippines, Palawan, and the Sunda Islands as far east as Timor. From the Andamans and Celebes *P. helenus* is not known. It must be split up into seven subspecies, which are as follows:—

- (a): *P. helenus* L., forma typ., from India, Burma, Siam, Malacca, China (and Southern Japan?);
- (b): *P. helenus daksha* Hamps. from South India;
- (c): *P. helenus mooreanus* subsp. nov. from Ceylon;
- (d): *P. helenus nicconicolens* Butl. from the Loo Choo Islands (and Japan?);
- (e): *P. helenus palawanicus* Stauding, from Palawan, Borneo, Sumatra, Nias, Engano, Java;
- (f): *P. helenus biseriatus* subsp. nov. from Timor and Sambawa.
- (g): *P. helenus hystaspes* Feld. from the Philippine Islands;

These local forms are especially distinguished by the different development of the greyish streaks in the outer region of the underside of the forewings and of the white area and the submarginal spots of the hindwings.

(a): **P. helenus** L., forma typ. [♂, ♀, larva, pupa].

Wallace (*loc. cit.*) separates the North Indian examples as "local form a" from the Chinese ones, and says that "they have more falcate wings and longer tail," and that "the red marks at the anal angle beneath are divided by a violet-white mark." These characters apply, however, to Chinese examples as well as to Indian ones. The specimens from Western India, where the typical *P. helenus* gradually approaches the larger *P. helenus daksha* Hamps., are often larger than those from Burma, Siam, Malacca, and China, but it can hardly be said that this is the rule.

In the *female* the white area of the hindwings is about the same size above and below.

In O. Möller's collection I found two very remarkable *male* specimens from Sikkim (October 1886, and October 1887), which I propose to name:—

(a²): ♂-ab. *rufatus* ab. nov.

The white patch of the hindwings is much reduced; above, it consists of three spots; the first is very narrow and lunate, the second a little longer than broad, the third narrowest behind, notched outwardly, a little longer anteriorly than broad; beneath, there are only two small lunulate spots left, the anterior one being obliterated. The submarginal spots of the hindwings below are transverse, much less arched than in typical *P. helenus*; the rufous anal mark is about twice as long as broad, and in the cellule between the lower median nervules the subanal and the submarginal rufous markings are entirely merged together, the interspace between them being completely filled up with rufous; one of the specimens has a rather large discal rufous spot before the upper median nervule.

These specimens on the upperside are almost identical with *P. iswara arthropherus* Hour.

Hab. India; Sikkim (9 ♂); Khasia Hills (2 ♂); Burma; Shan States (6 ♂); Malacca (1 ♂); China (5 ♂, 1 ♀); South Japan (Kiu-Shiu) (2 ♂).

I have two specimens from Kiu-Shiu, South Japan, which belong to the typical race of *helenus*, not to *nicconicolens* Butler, though they approach the latter a little in the form of the white patch to the hindwings.

(b): ***P. helenus daksha*** Hamps. [♂, ♀, larva, pupa].

Papilio helenus, Horsf. & Moore (*vec* Linné, 1758), *Cat. Lep. Ins. Mus. E. I. C.* 1 t. 3. f. 2. 2a (l., p.) (1857) (Canara).

Papilio (Charus) daksha Hampson, *Journ. As. Soc. Beng.* p. 363. n. 202 (1888) (Nilgiris: 1000 to 7000 feet, common: mentions larva).

Papilio (Charus) helenus, Ferguson, *Journ. Bombay N. H. Soc.* p. 447. n. 157 (1891) (Travancore: common in the hills).

Large. The grey internervular streaks in the outer region of the underside of the hindwings are much shorter than in *P. helenus*, a character which sometimes appears again in *P. helenus palawanicus* Standring.; the white area of the hindwings is larger than in *helenus*, scarcely smaller below than above, but not larger than in *P. helenus biseriatus* subsp. nov.; below, there are mostly, not always, two additional rufous spots between the white patch and the subanal rufous mark, as in many examples of other local forms of *P. helenus*.

Hab. South India: Nilgiris, Malabar (36 ♂, 16 ♀), Travancore.

(c): ***P. helenus mooreanus*** subsp. nov. [♂, ♀].

Charus helenus, Moore (*vec* Linné, 1758), *Lep. of Ceylon* 1. p. 149. t. 58. f. 3 (1881) (Ceylon).

Papilio helenus, Standinger, *Iris* VIII. p. 348 (1895) (Ceylon).

Grey streaks on the underside of the forewings as short as in *P. helenus daksha* Hamps.; the Naples-yellow scales of the upperside of the forewings form conspicuous internervular streaks in the outer region; the white area of the hindwings smaller (♂) beneath than above; on the underside of the hindwings there is a complete series of seven subdiscal blue lunules, of which the three anterior stand at the outer edge of the white discal marks, and of which the two posterior are situated within the anal and subanal rufous spots.

Hab. Ceylon (4 ♂, 3 ♀).

It is very curious that Mr. F. Moore does not either describe or figure the underside which exhibits the distinguishing characters.

(d): *P. helenus nicconicolens* Butler [σ , φ].

Papilio helenus, Orza (nec Linné, 1758), *Lep. Jap.* p. 9. n. 2 (1869) (Japan): Pryer, *Rhop. Nihon* p. 4. n. 7. t. 2. f. 2 (φ) (1886) (Nagasaki; Tosa); Lecch, *P. Z. S.* p. 208. n. 7 (1887) (Japan): id., *Batt. of China*, etc. p. 548 (1893) (*p.p.*).

Papilio nicconicolens Butler, *Ann. Mag. N. H.* (5). VII. p. 139 (1881) (Nikko).

Besides the two specimens said to be from Kiu-Shiu, mentioned above (p. 286), I have not had the opportunity to examine authentic individuals from Japan proper. Mr. Butler's type agrees perfectly with my specimens from the Loo Choo Islands, and disagrees with the Chinese individuals of *helenus*.

Large; discal creamy white area on the hindwings narrow, in most examples extended beyond the second discoidal nervule, the two median spots of that area about half as long again as broad on upperside, scarcely longer than broad on underside; submarginal lunules slender and arched, anal and subanal mark larger than in *P. helenus*; lowest cellule but one usually with complete submarginal orange red ring; between the second discoidal and second median veins there are often two red discal spots.

Hab. Loo Choo Islands (7 σ , 1 φ): (and South Japan?).

(e): *P. helenus palawanicus* Stauding. [σ , φ].

Papilio helenus, Zinken (nec Linné, 1758), *Nor. Art. Ac. Nat. Cur.* XV. p. 143. n. 2 (1831) (Java; *syn. ex p.*); Boisd., *Spec. Gén. Léop.* I. p. 211. n. 25 (1836) (*p.p.*); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 30 (1840) (*p.p.*): Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 57 (1846) (*p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 101. n. 205 (1857) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 28 (1860) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 404 (1864) (*p.p.*); Reak., *Pr. Ent. Soc. Phil.* p. 464. n. 13 (1864) (*p.p.*); Druce, *P. Z. S.* p. 357. n. 13 (1873); Oberth., *Et. d'Ent.* IV. p. 45. n. 68 (1879) (Java); Snell., *Midden-Sumatra. Lep.* p. 25. n. 7 (1880); Kheil, *Rhop. Nias* p. 37. n. 140 (1884) (Nias I.); Dist. & Pryer, *Ann. Mag. N. H.* (5). XIX. p. 273. n. 170 (1887) (Sandakan); Hagen, *Iris* VII. p. 21. n. 16 (1894) (Sumatra).

Papilio helenus local form *b*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 50. sub n. 56 (1865) (Java; Sumatra).

(?) *Papilio hystaspes*, Distant (nec Felder, 1862), *Proc. Ent. Soc. Lond.* p. 30 (1879).

Papilio helenus var. *palawanicus* Staudinger, *Iris* I. p. 278 (1888) (Palawan): id., *Iris* II. p. 12 (1889) (Palawan; "scarcely different from *P. helenus* L.").

Papilio (*Charus*) *helenus* var. *enganius* Doherty, *Journ. As. Soc. Beng.* p. 31. n. 50 (1891) (Engano).

Papilio (*Charus*) *helenus* var. *palawanicus*, Semper, *Philipp., Tagfalt.* p. 275. n. 402 (1892) (Domaran; Paragua).

Differs from *P. helenus* chiefly in the submarginal spots of the hindwings below being partly (or entirely) obliterated; most specimens are of comparatively small size. The white patch is smallest in Palawan specimens; the Sumatra and Java examples lead over to the next subspecies.

Hab. Palawan (4 σ , 1 φ); Balabac (1 σ , 1 φ); Borneo (7 σ , 1 φ); Sumatra (2 σ); Java (6 σ , 2 φ); Nias (12 σ); Engano (2 σ , 1 φ).

Unfortunately the name of *palawanicus* must stand for this Malayan form of *P. helenus*. Doherty's *P. var. enganius* (*l.c.*) is not different from *P. helenus palawanicus* Stauding.

(f): *P. helenus biseriatus* subsp. nov. [φ ; (?) σ].

Papilio helenus, De Haan (nec Linné, 1758), *Verh. Nat. Gesch. Ned. overz. bez.* p. 30 (1840) (*p.p.*: Timor).

Papilio helenus var., Vollenhoven, *Tijdschr. v. Ent.* III. p. 74. sub n. 28 (1860) (Timor-Koepang).

Papilio (*Charus*) *helenus*, Doherty, *Journ. As. Soc. Beng.* p. 192. n. 110 (1891) (Sumba, Sambawa mountains).

φ . The white patch on the hindwings above is continued beyond the upper median vein and reaches the middle median vein by means of somewhat dispersed white

scales; it also enters the cell in one specimen; the marginal spots are rather large above and below, and tinged with yellow, chiefly so in the Dili specimens; besides the anal lunule there are four red submarginal spots present in all three examples.

Below, the grey internervular streaks of the forewings are broad and as long as in *P. helenus*; between the lower discoidal nervule to the inner margin they are sharply cut off inwardly in a straight line; the hindwings have a complete series of submarginal spots, which are not or scarcely lunulate and of rather large size; the discal white area consists of at least five spots, of which the costal one is almost as long as broad, and of which the fifth, standing between the two upper median nervules, is small and mostly tinged with rufous; in one specimen there is a sixth but extremely small discal spot of a rufous colour behind the middle median vein between the subanal rufous mark and the cell; all three specimens have one or two rufous markings beyond the white or rufous-white discal spots between the lower discoidal and middle median veins.

♂. Nine *males* from Sambawa, from which island I unfortunately do not possess a *female*, belong probably to the same race as the Timor *females*. They differ from *P. helenus palawanicus* Stauding, especially in the more yellow anal and submarginal markings of the underside of the hindwings, in the much larger anal and subanal spots, and in the cell of the hindwings being, in comparison with its length, broader than in *P. helenus palawanicus*, especially towards the apex.

Hab. Timor; Dili (W. Doherty, May 1892) (*type*; 2 ♀); Oinainisa (W. Doherty, November to December 1891) (1 ♀); Sambawa (W. Doherty, September 1891) (9 ♂).

(g) : *P. helenus hystaspes* Feld. [♂, ♀].

Papilio hystaspes Felder, *Wien. Ent. Mon.* VI. p. 283. n. 34 (1862) (Luzon); *id.*, *Verh. z. b. Ges. Wien* p. 320. n. 405 (1864); *id.*, *Reise Novara, Lep.* I. p. 105. n. 80. t. 15. f. c (1865).
Papilio rarusi Reakirt, *Proc. Ent. Soc. Phil.* p. 465. n. 14 (1864) (Philippines).
Papilio (Charus) hystaspes, Semper, *Philipp., Tagfalt.* p. 274. n. 401 (1892) (Philippines).

This form differs from *P. helenus palawanicus* Stauding, chiefly in the white area of the hindwings being of almost the same size above and below in the *male*, and consisting of four spots, of which the last is not much shorter than the second. The submarginal spots of the underside of the hindwings are very variable; in a Mindoro *male* the six anterior ones are wanting.

Hab. Philippine Islands (3 ♂, 1 ♀).

Note.—The scales of the white patch on the hindwings above are in the *male* of *P. helenus* L. elongate and bidentate; in the *female* they are shorter, with the apex rotundate-truncate and tri- or quadridentate, as in the *male* of *P. castor* Westw. This difference between the sexes is, however, not at all constant, as the scales become also in the *male* often tri- or quadridentate. —K. J.

73. *Papilio iswara* White [♂, ♀].

Papilio iswara White, *Entomol.* I. p. 280 (1842) (Penang); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 58. t. 2. f. 1 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 19. n. 78 (1852); *id.*, *List Lep. Ins. B. M.* I. p. 23. n. 82 (1856); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 101. n. 204 (1858); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 408 (1861) (Penang; Malacca); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 51. n. 58 (1865) (Penang; Malacca; Singapore; Borneo); Butl., *ibid.* (2), *Zool.* I. p. 553. n. 15 (1877) (Mal. Pen.); Godm. & Salv., *P. Z. S.* p. 641 (1878) (Billiton I.); Dist., *Rhop. Mal.* p. 344. n. 9. t. 30. f. 1 (♂), 2 (♀) (1885) (Mal. Pen.); Hagen, *Berl. Ent. Zeit.* XXXV. p. 154. n. 169 (1892) (Banka I.); *id.*, *Iris* VII. p. 21. n. 15 (1894) (Sumatra).

Papilio araspes Felder, *Wien. Ent. Mon.* III. p. 321. n. 21 (1859) ("Luzon" *loc. err.*); id., *Verh. z. b. Ges. Wien* p. 320. n. 407 (1864); id., *Reise Novara, Lep.* I. p. 108. n. 83. t. 15. f. a (1865).
Wall., *Tr. Linn. Soc. Lond.* XXV. p. 51. n. 60 (1865) (Philippine Is., "acc. to Feld."): Oberth., *Et. d'Ent.* IV. p. 46. n. 71 (1879) ("Sylhet" *loc. err.*); Semp., *Philipp., Tagfalter* p. 275 note (1892) ("not found on Luzon").

Charus iswara, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 51 (1889) (Mergui).

Papilio heleus, Snellen, *Tijdschr. v. Ent.* XXXIII. p. 304. n. 75 (1890) (Belitong I.).

Though in structure almost identical with *P. heleus* L., with which species *P. iswara* flies together in Sumatra and Borneo, the present *Papilio* is always well distinguishable by the absence of a subanal reddish rufous mark from the underside of the hindwings.

Felder's *P. araspes*, which is said by Felder to be from Luzon, and of which there is a specimen without locality-label in Felder's collection, agrees exactly with smaller specimens of *P. iswara* from Borneo and Malacca, and must sink as a synonym.

P. iswara occurs in three races over Malacca, Natuna Islands, Sumatra, Banka, Billiton, Borneo, Celebes, Bangkai Island, and the Sula Islands.

(a): **P. iswara** White, forma typ. [σ , φ].

The white patch on the hindwings is very large above, consisting of four spots; the edges of the last spot are not sharply defined; in the *female* there are often two more spots of small size between the median nervules; these latter spots are present below in both sexes. The underside of the hindwings exhibits besides the two more or less complete orange rufous rings, one of which stands at the anal angle, while the other is marginal and stands before the lower median nervule, three rather large blue spots between the lower median and discoidal veins; in one *female* from Borneo (Lawas) there are present, besides those markings, five orange rufous submarginal spots; the three anterior are narrow and lunate, the fourth is minute, the fifth is also lunate, but longitudinal, standing with its convex side at the second median vein, and being joined to the marginal spot of the same cellule.

Hab. Malacca (4 σ); Sumatra; Banka; Billiton; Borneo (3 σ , 2 φ); Natuna Islands (2 σ).

(b): **P. iswara sataspes** Feld. [σ , φ].

Papilio sataspes Felder, *Verh. z. b. Ges. Wien* p. 320. n. 406 (1864) (Celebes; *non. und.*); id., *Reise Novara, Lep.* I. p. 106. n. 81. t. 15. f. e (σ) (1865) (Celebes); Hopff., *Stett. Ent. Zeit.* p. 20. n. 15 (1874) (Celebes); Oberth., *Et. d'Ent.* IV. p. 15. n. 69 (1879) (Celebes); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

Papilio hecuba Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 50. n. 57. t. 5. f. 3 (σ) (1865) (Celebes).

Papilio heleus, Piepers, *Tijdschr. v. Ent.* XIX. *Verh.* p. 17 (1876) (Celebes).

Papilio heleus var. *sataspes*, Piepers, *ibid.* XXI. p. 39. n. 157 (1878) (Mangkasar: Amperang: Bantimoerong).

The submarginal spots on the underside of the hindwings, which vary in number, are yellow; of the blue subdiscal spots usually only one is present. The white area of the hindwings is composed of three spots; the fourth is feebly marked below, seldom above; in one *female* of my collection the fourth spot is, however, rather large, and there are on the underside three more white markings between it and the abdominal margin.

Hab. Celebes (7 σ , 2 φ).

(c): **P. iswara artaphernes** Honr. [σ , φ].

Papilio heleus var. *artaphernes* Honrath, *Berl. Ent. Zeitschr.* XXX. p. 295 (1886) (Bangkai I.).

Papilio artaphernes, Staudinger, *Iris* VIII. p. 347 (1895).

Papilio artaphernes var. ? *ahaverrus* Staudinger, *l.c.* p. 347 (1895) (Mangola, Sula Is.).

Honrath's *artaphernes* and Staudinger's *chasverus* are the same; both authors are quite wrong in comparing this insect with *Papilio helenus* L., instead of with *P. iswara sataspes* Feld. from Celebes. With *P. fuscus* Goeze (= *severus* Cram.), to which *artaphernes* is not, as Staudinger erroneously says it is, in many respects more closely allied than to *P. helenus* L., the present *Papilio* has nothing to do; it has in the ♂ the outer region of the forewings covered with hairs, like *P. helenus* L. and *P. iswara* White.

The white patch on the upperside of the hindwings is reduced in size, below it is often absent. The submarginal spots to the hindwings below are yellow, as in *P. iswara sataspes* Feld.

Hab. Bangkai Island (in coll. Adams and Godman & Salvin); Mangola, Sullak Islands (3 ♂, 1 ♀).

VII. NEPHELUS-GROUP.

This group and the *memnon*-, *gambrius*-, *oritas*-, *polytes*-, and *castor*-groups will most probably come under one generic term in the future generic revision.

74. *Papilio nephelus* Boisid. [♂, ♀].

Papilio nephelus Boisduval, *Spec. Gén. Léop.* I. p. 210. n. 24 (1836) (Celebes); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 29 (1840) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 56 (1846) (*p.p.*); Gray, *List Lep. Ins. B. M.* I. p. 23. n. 79 (1856) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 27 (1860) (Celebes); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 411 (1864); Oberth., *Et. d'Ent.* IV. p. 113. n. 66 (Celebes, *nee* Sumatra).

This species has developed into three geographical forms, namely:—

- (a): *P. nephelus* Boisid., inhabiting Celebes and Java;
- (b): *P. nephelus saturnus* Guér., inhabiting Sumatra, Malacca, Borneo;
- (c): *P. nephelus uranus* Weym., inhabiting Nias.

(a): *P. nephelus* Boisid., forma typ. [♂, ♀].

The form which inhabits Celebes (where it is apparently very rare) and Java is slightly different from that found in Borneo, Sumatra (Dili), and Malacca; the specimens are smaller; the spots composing the subapical band of the forewings, and the white spot near the hinder angle of the forewings below are smaller. The submarginal lunules on the *underside* of the hindwings are thinner, often obliterated; the base of that wing is more densely covered with wax-yellow scales, and the two posterior spots of the discal row are smaller.

Hab. Celebes (2 ♂, *teste* Felder); Java (3 ♂, 1 ♀).

(b): *P. nephelus saturnus* Guér. [♂, ♀].

Papilio nephelus, De Haan (*nee* Boisduval, 1836), *l.c.* p. 29 (*p.p.*) t. 4. f. 4 (1810); Doubl. Westw. & Hew., *l.c.* p. 11. n. 56 (1846) (*p.p.*; "Nepaul" *loc. err.*); Gray, *Cat.*, etc. p. 18. n. 75 (1852) ("Northern India" *loc. err.*); id., *List*, etc. p. 23. n. 79 (1856) (*p.p.*); Wall., *l.c.* p. 51. n. 61 (1865) (Malacca; Sumatra; Borneo; "Assam" *loc. err.*); Oberth., *Ent. d'Ent.* IV. p. 45. n. 66 & p. 113. n. 66 (1879) (Borneo & Sumatra, *nee* Celebes); Stauding. & Schatz, *Exot. Schin.* I. p. 7. t. 4 (♂) (1884) (Borneo; Sumatra; Malacca).

Papilio saturnus Guérin, *Rev. Zool.* p. 43 (1840) ("Côte Malaye"); id., in Deless., *Sour. Voy. Inde* p. 70 (1843) (Pulo Penang); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 412. & p. 367. n. 243 (♀) (1864) (Sumatra; Penang; Malacca; Borneo; "Assam" *loc. err.*).

Papilio neptunus Guérin, in Deless., *Sour. Voy. Inde* t. 18 (1843) ("neptunus" *err. typ.*).

Papilio nephelus var. *saturnus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 18. sub n. 17 (1852) ("Northern India" *loc. err.*); id., *List*, etc. p. 23. sub n. 79 (1856); Dist., *Rhop. Mal.* p. 345. n. 11. t. 30. f. 3 (♂), 4 (♀), 5 (♀) (1885) (Mal. Pen.); Hagen, *Tris* VII. p. 22. n. 17 (1894) (Sumatra).

Guérin (*l.c.*) distinguishes this race from the preceding one by the forewings having five spots instead of four, and by the hindwings being devoid of the small spot behind the middle median nervule mentioned in Boisduval's description of *P. nephelus*; the latter spot appears, however, sometimes in both races, and in the number of spots composing the subapical band of the forewings my specimens from Celebes (and Java) do not differ from those from Sumatra, Malacca, and Borneo.

The *females*, which are of a paler brown-black ground-colour than the *males*, have often the buffish white area of the upperside of the hindwings continued on to the abdominal margin by means of two additional spots, which are in a *female* from Borneo very long; the same specimen has a white spot in the apex of the cell of the forewings below and above; in some other *females* that spot is present only below or is wanting. In most examples the two submarginal lunules before and behind the upper median nervule on the underside of the hindwings are merged together at that veinlet with the respective marginal lunules; in other specimens nearly all the marginal spots are joined to the submarginal ones; the submarginal lunule behind the second median nervule is sometimes obsolete.

(a²): ♀-ab. *albolineatus* Forbes.

Papilio albolineatus Forbes, *Nat. Wand. E. Arch.* p. 275 (1885) (Borneo): Waterh., *Id.* II. t. 166. f. 1 (1886).

The above-mentioned *female* from Borneo belongs to this aberration, which is distinguished, besides by the cellular white spot of the forewings, by two clearly marked elongate white spots at the hinder angle of the forewings on the upperside.

Hab. Malacca (8 ♂, 5 ♀); Sumatra (3 ♂, 2 ♀): Borneo (11 ♂, 2 ♀, including type of *albolineatus* Forbes).

(c): **P. nephelus uranus** Weym. [♂, ♀].

Papilio uranus Weymer, *Stett. Ent. Zeit.* p. 271 (♂, ♀) (1885) (I. of Nias).

Papilio nephelus var. *uranus*, Honrath, *Berl. Ent. Zeit.* XXIX. p. 275 (1886).

The subapical macular band of the forewings is entirely absent, at least from the upperside.

Hab. Island of Nias (32 ♂).

75. **Papilio nubilus** Stauding. [♂].

Papilio nubilus Staudinger, *Iris* VII. p. 344 (1895) (Brunei, N. Borneo).

Dr. Staudinger kindly lent me the type of this species, and, though my first impression was that the unique specimen might be a sport of *P. nephelus*, I now think that it stands better separate from *P. nephelus* Boisd. as a species, till further researches show that it is not distinct.

The band on the upperside of the hindwings is similar in shape to that of *P. hipponous* Feld.

Hab. Brunei, North Borneo (1 ♂ in coll. Staudinger).

76. **Papilio chaon** Westw. [♂, ♀].

Papilio chaon Westwood, *Arc. Ent.* II. p. 97. t. 72. f. 1. 1* (♂) (1845) (Assam): Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 55 (1846) (Nepaul; Assam): Gray, *Cat. Lep. Ins. B. M.* I. p. 18. n. 76 (1852) (N. India); id., *List Lep. Ins. B. M.* I. p. 23. n. 80 (1856) (Sylhet): Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 102. n. 205 (1857) (Assam; Sikkim; var. "Borneo" *loc. err.* aut *P. nephelus saturvus?*); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 410. & p. 367. n. 242 (1864) (Ind. sept.; "Malacca, Borneo" *loc. err.*); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Druce, *P. Z. S.* p. 109. n. 5 (1874) (Siam); Oberth., *Et. d'Ent.* IV. p. 45. n. 67

(1879) (Sylhet; Assam). Elwes, *Tr. Ent. Soc. Lond.* p. 429. n. 412 (1888) (Sikkim; not uncommon in low valleys, from April to October); Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 192 (1890) (Shan States); Robbe, *Ann. Soc. Ent. Belg.* p. 124. n. 7 (1892) (Darjeeling; Kursong); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin; China).

Papilio (Charus) chaon, Elwes & Nicéville, *Journ. As. Soc. Beng.* p. 436. n. 136 (1886) (Ponsekai); Nicéy., *Gazetteer of Sikkim* p. 172. n. 479 (1894) (Sikkim; common at low elevations, from April to October).

Charus chaon, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312. n. 385 (1893) (Khasia Hills; common).

P. chaon is the Indian representative of *P. nephelus*, and very closely allied to that species; the distinguishing characters seem to me to be of no great importance, and I shall not be surprised when intermediate examples between *chaon* and *nephelus* turn up some day from Siam, Tenasserim, or the northern parts of the Malay Peninsula.

The subapical band of the forewings of *nephelus* is here indicated only in the female; the marginal apical white mark is mostly of the same size as in *nephelus*, but sometimes obliterated; the submarginal lunules of the hindwings below are of a yellowish buff colour, not white. I must, however, state that in a specimen of *P. nephelus uranus* Weym. these spots are also buffish, though paler than in *P. chaon*; in most specimens the submarginal lunules are smaller than in *P. nephelus saturnus* Guér., often partly obliterated, but sometimes they are large, and, as in *saturnus*, partly merged together with the marginal spots.

Hab. Assam (4 ♂, 1 ♀); Sikkim (15 ♂, 4 ♀); Shan States (2 ♂); Tonkin; China.

My smallest male, from Shillong, Assam, has the forewing of a length of 43 mm.; in my largest male, from Sikkim, that wing is 65 mm. long.

Tonkinese and Chinese specimens are unknown to me.

77. *Papilio diophantus* Grose Smith [♂, ♀].

Papilio diophantus Grose Smith, *Ent. Mo. Mag.* XIX. p. 234 (♀) (1883) (Sumatra); id. & Kirby, *Rhop. Ex., Pap.* p. 1 (♂, ♀). t. 1. f. 3. 4 (♂) (1887); Hagen, *Iris* VII. p. 22. n. 19 (1894) (Sumatra; not under 1000 m.).

Very constant. The patch of the hindwings is sometimes connected with the abdominal margin by means of a narrow yellowish band. The red streaks in the basal region of the hindwings, below, are very peculiar. The species has no near relative at present.

Hab. Sumatra (4 ♂).

78. *Papilio fuscus* Goeze [♂, ♀, metam.].

Seba, *Thes.* IV. p. 51. t. 43. f. 1. 2 (1765); id., p. 57. t. 46. f. 17. 18 (1765)

♀. *Papilio Eques Achirus fuscus* Goeze, *Ent. Beytr.* III. 1. p. 87. n. 71 (1779) (*type: Seba's figure on t. 43*).

♂. *Papilio Eques Achirus emereomaculatus* Goeze, *l.c.* p. 88. n. 76 (1779) (*type: Seba's figure on t. 46*).

♂ ♀. *Papilio Eques Trojanus severus* Cramer, *Pap. Ec.* III. p. 153. t. 277. f. A. B (♂). & p. 154. f. A. B (♀) (1782) (Amboina).

♂. *Papilio Eques Trojanus severus*, Esper, *Aust. Schmett.* p. 125. n. 55. t. 31. f. 1 (1785-98) ("♀" *ex err.*).

♂ ♀. *Papilio Eques Trojanus helonus*, Fabricius, *Mant. Ins.* II. p. 1. n. 3 (1787) (*p.p.*): id., *Ent. Syst.* III. 1. p. 2. n. 3 (1793) (*p.p.*).

♂ ♀. *Papilio Eques Trojanus helonus* var. *severus*, Jablonsky, *Naturs. Schmett.* II. p. 170. sub n. 40 (1784); Gmelin, *Syst. Nat.* p. 2227. sub n. 4 (1790).

♂ ♀. *Achillides severus*, Hübner, *Verz. lok. Schm.* p. 85. n. 876 (1816).

♂ ♀. *Papilio severus*, Godart, *Enc. Méth.* IX. p. 68. n. 118 (1819) (*p.p.*): Guér., *Voy. Coquille, Ins.* t. 14. f. 1 (1829); Boisdu., *Spéc. Gén. Léop.* 1. p. 212. n. 26 (1836) (*p.p.*): De Haan, *Verh. Nat.*

Gesch. Ned. oerz. bez. p. 30 (1840); Guérin, *Voy. Coquille, Zool.* III. p. 273 (1842) (Amboina); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 59 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 19. n. 79 (1852) (*p.p.*); Blanch., *Voy. Pôle Sud. Lep.* p. 379 (*p.p.*). t. 1. f. 6. 7 (1853); Vollenbov., *Tijdschr. v. Ent.* III. p. 74. n. 29 (1860) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 319. n. 403 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 49. n. 52 (1865) (Burn; Ceram; Amboina; Gilolo; Batjan; *nee* Aru Is.); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 254. n. 63 (1869); Oberth., *Et. d'Ent.* IV. p. 46. n. 75 (1879) (Amboina); id., *Ann. Mus. Civ. Genova* XV. p. 475. n. 20 (1880); Stauding. & Schatz, *Evot. Schmett.* I. p. 7. t. 4 (♂) (1884); Pagenst., *Jahrb. Nass. Ver. Nat.* p. 292 (1884) (*p.p.*); Butl., *Ann. Mag. N. H.* (5). XIII. p. 197. n. 45 (1884) (Amboina).

Papilio castaneus var. *cinereomaculatus*, Kirby, *Cat. Diurn. Lep.* p. 810. sub n. 180 (1877).

♂ ♀. *Papilio cinereomaculatus*, Ribbe, *Iris* II. p. 208. n. 5 (1890) (Ceram; *nee* Papua); Röber, *Tijdschr. v. Ent.* XXXIV. p. 273 (1891) (Ceram).

The figures 1 (upperside) and 2 (underside) of plate 43 of Seba's *Thesaurus* IV., though incorrect and exaggerated in pattern, fit rather well to certain *female* specimens of Cramer's *P. severus*, in which the white discal markings on the underside of the hindwings are reduced to small lunate spots; the hindwings of Seba's *Papilio* have, on the upperside, a series of reddish submarginal lunules, and, behind the white discal area that is formed as in Cramer's insect, a series of blue spots, which in Seba's figure are too sharply defined. To this figure Goeze (*l.c.*) gave the name of *P. (E. Ach.) fuscus* three years before Cramer described and figured the same insect as *P. (E. Tr.) severus*. To the figures 17 (upperside) and 18 (underside) of plate 46 of Seba, which represent a *male* specimen of the same insect with the white markings of the underside of the hindwings of the usual rather large size, Goeze gave the name of *P. (E. Ach.) cinereomaculatus*; as Goeze enumerates *fuscus* under n. 71 and *cinereomaculatus* under n. 76 in the same volume, the name of *P. fuscus* has to stand.

A number of insects allied to *P. fuscus* have been described as distinct species, which are, however, not always distinguishable from each other and *P. fuscus*, and must, therefore, be treated partly as local forms of that species and partly as mere aberrations; thus we have the following races:—

- (a): *P. fuscus* Goeze from the Moluccas;
- (b): *P. fuscus castaneus* Goeze from Celebes, Sula Islands, and Sangir Island;
- (c): *P. fuscus rotulita* Swinhoe from the Key and Aru Islands;
- (d): *P. fuscus beccarii* Oberth. from Dutch and German New Guinea;
- (e): *P. fuscus indicatus* Butl. from British New Guinea;
- (f): *P. fuscus capaneus* Westw. from North Australia;
- (g): *P. fuscus xenophilus* Mathew from the Solomon Islands;
- (h): *P. fuscus prevaspes* Feld. from Malacca, Sumatra, Borneo, Andaman Islands.

Papilio oelix Godm. & Salv. and *P. albinus* Wall. I consider to be separate species for reasons given below.

In Java, the lesser Sunda Islands, and the Philippines no representative has as yet been found; it will probably be a form similar to *P. fuscus prevaspes* Feld.

(a): **P. fuscus** Goeze, forma typ. [♂, ♀].

Both sexes are very variable in pattern. The forewings have often subapical and anal white markings; sometimes there is, on the underside, a complete white band, as in *P. fuscus capaneus* Westw.; this band stands mostly farther from the outer margin than in that subspecies. The white discal area of the hindwings reaches sometimes the abdominal margin of the wing, as is usually the case in

P. fuscus beccarii Oberth. and *P. fuscus capaneus* Westw.; in one of my specimens it extends only as far as the upper median nervule; the patch enters the cell or does not touch it; sometimes the nervules traversing it are rather broadly black; thus the patch consists in an Amboina specimen in my collection of five spots, of which the first and the two last are small, the second and third large. Beyond the discal white patch stands often a rather well-marked series of blue, or bluish grey, or buffish, or whitish lunules. Many examples have an anal orange-red spot, some a more or less complete series of submarginal orange spots. On the underside, the hindwings exhibit a great variation in the number and size of the discal white markings, as well as in the development of the discal blue and the submarginal orange-yellow spots. A Ternate specimen has only the three anterior white spots indicated by a number of white scales, a little more so than certain examples of *P. albivus thomsoni* Butl.; the other white spots are absent. The submarginal spots are sometimes of a pale buff colour; in most specimens they are rather large, but not seldom they are as feeble as in *P. fuscus indicatus* Butl. The interspaces between the submarginal and the blue subdiscal spots are in one female tinged with reddish ferruginous. The tails are often non-spatulate; in a male from Amboina they are rather short; Oberthür (*l.c.*) records a specimen from Ternate as having short, non-spatulate tails.

The specimens from the Northern Moluccas are apparently on an average smaller than those from the Southern Moluccas, and have mostly the white area of the upperside of the hindwings relatively rather shorter and broader; their hindwings are also generally somewhat shorter.

Hab. Amboina (W. Doherty, February 1892) (16 ♂, 8 ♀); Buru; Saparna (1 ♂, 1 ♀); Ceram (8 ♂, 3 ♀); Batjan (W. Doherty, March 1892) (3 ♂, 2 ♀); Ternate (W. Doherty) (2 ♂); Halmahera (W. Doherty, August 1892) (5 ♂, 4 ♀).

(b) : ***P. fuscus castaneus*** Goeze [♂, ♀].

Seba, *Thes.* IV. p. 55. t. 45. f. 7. 8 (1765).

Papilio Eques Achivus castaneus Goeze, *Ent. Beytr.* III. 1. p. 88. n. 75 (1779) (*type* : Seba's figure on t. 45).

Papilio Eques Trojanus severus, Esper, *Aust. Schm.* p. 125 ("♀," "unc" ♂). t. 31. f. 2 (1785-98).

Papilio severus, Boisduval, *Spec. Gén. Léop.* I. p. 212. n. 26 (1836) (*p.p.*) : Donbl. Westw. & Hew., *Gen. Down. Lep.* I. p. 11. n. 59 (1846) (*p.p.*) : Gray, *Cat. Lep. Ins. B. M.* I. p. 19. n. 79 (1852) (*p.p.*) : Feld., *Verh. z. b. Ges. Wien* p. 319. p. 403 (1864) (*p.p.*) : Pagenst., *Jahrb. Nass. Ver. Nat.* p. 202 (1884) (*p.p.*) : Westw., *Tr. Ent. Soc. Lond.* p. 468. n. 3 (1888) (N. Celebes).

♂ ♀. *Papilio pectinax* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 49. n. 53. t. 5. f. 4 (♂) (1865) (Celebes) : Oberth., *Et. d'Ent.* IV. p. 46. n. 74 (1879) (Celebes : "Ternate" *loc. err.*) : Ribbe, *Iris* II. p. 209. sub n. 5 (1890) (distinct species).

Papilio castaneus, Kirby, *Cat. Diurn. Lep.* p. 810. n. 180 (1877).

♂ ♀. *Papilio severus* var. *pectinax*, Snellen, *Tijdschr. v. Ent.* XXII. p. 61 (1879) (Celebes).

Papilio severus var. *minor* Oberthür, *Et. d'Ent.* IV. p. 46. sub n. 75 (1879) (Sangir I.).

Large specimens have the costal margin of the forewings more arched than *P. fuscus* Goeze. A feeble buff subdiscal band is mostly present on the forewings posteriorly, above and below; it is not marked anteriorly as in *P. fuscus*. The white discal area of the hindwings is smaller than in *fuscus*, especially narrower; the tails are broad and spatulate; sometimes there is a minute orange anal spot above. On the underside of the hindwings the posterior spots of the discal row are small and mostly orange, often obliterated.

Hab. Celebes (W. Doherty, August to September 1891) (5 ♂, 1 ♀); Sula Islands (1 ♂, 1 ♀); Sangir Island (W. Doherty) (4 ♂, 3 ♀).

Oberthür's *P. severus* var. *minor* is based on small specimens from Sangir; my specimens from that island are larger than, or as large as, my Celebesian examples, and do not differ from them subspecifically. In two of the Sangir and one of the Sula specimens the white patch on the hindwings is larger than in typical *castaneus*. The tails of my Sula specimens are a little longer and at the base thinner than in the Celebesian ones.

(c): ***P. fuscus rotalita*** (Swinh.) [σ , φ].

(?) *Papilio severus*, Wallace (*see* Cramer, 1782), *Tr. Linn. Soc. Lond.* XXV. p. 49, n. 52 (1865) (*p.p.*).

Papilio indicatus, Semper (*see* Butler, 1876), *Journ. Mus. Godtffroy*. Heft 14. p. 42. sub n. 131 (1878) (Aru Is.); Janson, *Cruise of Marchesa* II. p. 376. n. 80 (1886) (Aru Is.).

Papilio beccarii, Ribbe (*see* Oberthür, 1879), *Iris* I. p. 78. n. 4 (1886) (Aru Is., rare); Röber, *Tijdschr. v. Ent.* XXXIV. p. 273 (1891) (Key Is.).

σ . *Charus rotalita* Swinhoe, *Ann. Mag. N. H.* (6). XII. p. 257 (1893) (Key Is.).

σ φ . *Papilio septimius* Staudinger, *Iris* VII. p. 345 (1895) (Aru Is.).

I have compared four specimens of this subspecies, including the types of *P. rotalita* (Swinhoe) and *P. septimius* Staudinger, and must say that there is next to nothing to distinguish this race from *P. fuscus indicatus* Butl. and from *P. fuscus capaneus* Westw. The band of the forewings is reduced to some spots in the apical region, as in many *indicatus* and some *capaneus*; the band of the hindwings above is narrow, consisting of three larger spots between the subcostal and upper median nervule, a lunate spot at the costal margin, and another small lunate spot behind the upper median nervule; between the second median vein and the abdominal margin there are sometimes some white scales, indicating the spots standing there in most examples of *capaneus*; the three large spots are rounded exteriorly, as is the posterior of them in *capaneus*, while the two anterior ones are cut off obliquely in *capaneus*; below there are three or four white markings on the disc between the costal margin and the upper median nervule, the first and last are minute.

Hab. Key and Arn Islands.

(d): ***P. fuscus beccarii*** Oberth. [σ , φ].

Papilio severus, Boisduval (*see* Cramer, 1782), *Spec. Gén. Lép.* I. p. 212. n. 26 (1836) (*p.p.*):

Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 59 (1846) (*p.p.*): Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 29 (1860) (*p.p.*): Feld., *Verh. z. h. Ges. Wien* p. 319. n. 403 (1864) (*p.p.*).

σ φ . *Papilio beccarii* Oberthür, *Et. d'Ent.* IV. p. 46. n. 76 (1879) (Dorey; *nom. nud.*): *id.*, *Ann. Mus. Civ. Genova* XV. p. 475. n. 21. t. 3. f. 1 (σ), 2 (φ) (1880) (Waigen; Andai).

(?). σ φ . *Papilio severus* (?), Moutrouzier, *Ann. Sc. Phys. Nat. Linn.* p. 397 (1856) (Woodlark I.); *id.*, *Essay Faune Woodl.* p. 119 (1857).

This form has the wings shaped as smaller examples of *P. fuscus*: the tails are, however, thinner at the base. The pale band on the upper-side of the forewings, which is mostly so well defined in *P. fuscus capaneus* Westw., is absent from *beccarii*, or it is indicated near the costal margin by some white spots which stand, as in *P. fuscus rotalita* (Swinhoe), farther from the end of the cell than in *P. fuscus*; in many specimens the band is also marked in the anal region. On the underside the band is sometimes as well defined as in *P. fuscus capaneus*. In some individuals it is, however, reduced to about three spots, standing in the anterior region of the wing, as in *P. fuscus rotalita* (Swinhoe). The white area of the hindwings above is variable in size; sometimes it touches or even enters the discoidal cell, or it is separated from the cell by an interspace of about 1 mm. Below, the hindwings are similar to those

of *P. fuscus capaneus* Westw., and vary just as much as in that subspecies; the discal row of white patches and lunules is not always complete in the ♂: the anterior and the three posterior spots are mostly very thin, the latter sometimes obsolete: the three large markings are in certain individuals more than twice as large as in others. The submarginal orange spots are sometimes partly or all absent in the ♂.

The single character by which this form can apparently always be distinguished from *P. fuscus capaneus* Westw. and *indicatus* Butl. is the absence or minuteness of the subapical white spots of the upperside of the forewings.

Hab. Waigen (acc. to Oberthür); Dutch New Guinea: Dorey (66 ♂, 34 ♀); Humboldt Bay (7 ♂, 1 ♀).

Montrouzier's *P. severus* from Woodlark Island comes apparently nearer to *P. fuscus xenophilus* Mathew and *P. fuscus capaneus* Westw. than to the present race, since Montrouzier describes it as having a white band on the forewings, which posteriorly is obliterated; the band of the hindwings seems to be of the form of that of *capaneus*.

(e): **P. fuscus indicatus** Butl. [♂, ♀, metam.].

Papilio indicatus Butler, *Ann. Mag. N. H.* (4). XVIII. p. 248, n. 92 (1876) (Pt. Moresby); id., *P. Z. S.* p. 471 (1877) (S. New Guinea); Mathew, *Tr. Ent. Soc. Lond.* p. 170, t. 4. f. 3. 3a. 3b (*l., p.*) (1878) (Pt. Moresby); Grose-Smith & Kirby, *Rhop. Ex. I. Pap.* t. 3. f. 1. 2 (♀) (1888).

Papilio capaneus, Oberthür, *Et. d'Ent.* IV. p. 47, n. 77 (1879) (*p.p.*).

Differs from the following subspecies in the much smaller anal orange-red spot on the upperside of the hindwings, and in the very thin orange-red submarginal markings on the underside of those wings. These markings are, however, sometimes also very small in *P. fuscus capaneus*, and such specimens of *capaneus* are scarcely or not distinguishable from *P. fuscus indicatus* Butl.

Hab. British New Guinea (5 ♂, 3 ♀).

(f): **P. fuscus capaneus** Westw. [♂, ♀].

Papilio capaneus Westwood, *Proc. Ent.* II. p. 15, t. 52, f. 1. 2 (1843) (Australia); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11, n. 60 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 19, n. 80 (1852); id., *List Lep. Ins. B. M.* I. p. 24, n. 84 (1856) (Richmond R. & Moreton Bay); Feld., *Verh. z. b. Ges. Wien* p. 319, n. 402 (1864) (Austral. sept. et occ.); Butl., *Ann. Mag. N. H.* (4). XX. p. 125, n. 23 (1877) (Cape York); Semper, *Journ. Mus. Godeffr.* Heft 14, p. 42, n. 131 (1878) (Bowen; Pt. Mackay; C. York); Oberth., *Et. d'Ent.* IV. p. 47, n. 77 (1879) (*p.p.*); id., *Ann. Mus. Civ. Genova* XV. p. 476, sub n. 21 (1880) (Australia); Mathew, *Proc. Linn. Soc. N.S. Wales* p. 264 (1885) (Thursday I.).

The buffish band of the forewings varies from being complete to being reduced to two or three small spots behind the costal margin, above and below. The three posterior spots of the median white band on the *upperside* of the hindwings are mostly thin, sometimes, however, scarcely narrower than in certain examples of *P. fuscus xenophilus* Mathew; the two posterior ones are seldom absent. The submarginal orange-red spots vary in number from 1 to 6. On the *underside* of the white subdiscal markings, which have in most specimens the same position as in *P. fuscus rotalita* (Swinhoe) and *P. fuscus beccarii* Oberth., but stand sometimes closer to the cell, nearly as in *P. fuscus Goeze*, vary in number from 7 to 3: the series of submarginal spots, which are much more yellow than above, and even whitish, is complete, though in my ♂ specimen from Thursday Island the spots are partly overpowdered with black.

My largest specimen of *capaneus* is of exactly the same size as my smallest of *P. fuscus xenophilus* Mathew.

Hab. Northern Australia (16 ♂, 10 ♀): Thursday Island (1 ♂, 1 ♀).

(g) **P. fuscus xenophilus** Mathew [♂, ♀].

♂. *Papilio xenophilus* Mathew, *P. Z. S.* p. 348 (1886) (Ugi, Solomon Is.).

Differs from *P. fuscus capaneus* Westw. in being usually larger and in having the band of the hindwings proportionally narrower in the middle, and broader from behind the upper median nervule.

The band of the forewings, which is sometimes obliterated in the middle, varies in shape, as does that of *P. fuscus capaneus* Westw. Besides the anal orange spot, which is seldom obsolete on the upperside, there are a number (1 to 4) of rather feeble submarginal spots; below, the submarginal spots are rather large, as in many *P. fuscus capaneus*; the white spots vary in number from 3 to 7: the second to fourth spots are, as in the other races of *P. fuscus* Goeze, the largest, but remain in *xenophilus* rather small, being mostly much broader (transversely) than long.

Hab. Solomon Islands: Ugi, Guadalcanar (5 ♂, 3 ♀), Rubiana (2 ♀), Alu (2 ♀).

(h) **P. fuscus prexaspes** Feld. [♂, ♀].

Papilio prexaspes Felder, *Verh. z. b. Ges. Wien* p. 320. n. 409 (1864) (Malacca: non. ind.); *id.*, *Reise Novara, Lep.* I. p. 107. n. 82. t. 15. f. D (1865) (Malacca): Butl., *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 553. n. 14 (1877) (Mal. Pen.); Oberth., *Et. d'Ent.* IV. p. 46. n. 72 (1879) (Andaman Is.); Wood-Mas. & Nicéy., *Journ. As. Soc. Beng.* p. 254. n. 103 (1881) (Andaman Is.: ♀ descr.); Distant, *Rhop. Mal.* p. 345. n. 10. t. 29. f. 2 (♂) (1885) (Mal. Pen.).

Comes very close to certain rather small examples of *P. fuscus* Goeze which have a comparatively large white area to the hindwings; it differs chiefly in that area being narrower at the costal margin, and in the white spot near the hinder angle of the forewings on the underside being always very small.

The Bornean examples, which may represent a separate subspecies, have the white spots on the underside of the hindwings, especially the three posterior ones, larger, at least in the four specimens in my collection. In the Andaman individuals the blue spots on the underside of the hindwings are rather large; in Felder's type these spots are all marked, but are small.

Hab. Malacca (2 ♂); Andaman Islands (8 ♂); Borneo (4 ♂).

With *P. helenus* L. this insect has nothing to do, especially because the outer region of the upperside of the forewings is covered with dense hairs in that species. It bears a rather close resemblance to *P. chaon* Westw., from which it is, however, distinguished *inter alia* by the abdomen having a continuous white line at each side below, whereas in *P. chaon* (and *P. nephelus* Bois-d.) there is a row of separate white dots situated at the hind edges of the segments, and by the presence of blue spots on the underside of the hindwings.

79. **Papilio cilix** Godm. & Salv. [♂, ♀].

Papilio — (?) Godman & Salvin, *P. Z. S.* p. 148. n. 34 (1877) (New Ireland).

Papilio albinus, *id.* (nec Wallace, 1865), *l.c.* p. 160. n. 44 (1879) (New Ireland).

♂ ♀. *Papilio cilix* *id.*, *l.c.* p. 653 (1879) (New Ireland).

Distinguishable from *P. fuscus* and its races by the white area of hindwings being much broader between the upper median nervule and the abdominal margin of the wing than in those insects.

In the *male* the forewings are on the upperside devoid of a band or of spots replacing it; on the underside they have often a series of white spots which become

obsolete towards the costal margin. The white band of the hindwings mostly enters the apex of the cell; at the costal margin it is often dilated towards the base; the anal orange-red spot is in some specimens feeble. On the underside the white discal patch consists of seven spots, which are larger than in *P. fuscus* Goeze, and of which the third and fourth often touch the apex of the cell.

In the *female* the forewings exhibit above a faint macular pale band, which is clearly marked below, and becomes on both sides obsolete anteriorly; in my *female* from New Britain there is a minute white spot in the apex of the cell on the underside of the hindwings.

Hab. New Ireland (8 ♂, 1 ♀); New Britain (13 ♂, 6 ♀); (?) Duke of York.

This species is very constant in comparison with its allies, and can always readily be recognised by the pattern of the wings. Intermediate examples between this *Papilio* and *P. albinus* Wallace and *P. fuscus* Goeze are unknown to me.

80. *Papilio albinus* Wallace [♂, ♀].

Papilio severus auct. p.p.?

Papilio albinus Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 49. n. 54. t. 5. f. 5 (♂) (1865) (New Guinea); Oberth., *Et. d'Ent.* IV. p. 46. n. 73 (1879) (Amberbaki); Grose Smith, *Nor. Zool.* I. p. 333. n. 8 (1894) (Humboldt Bay).

Papilio severus var. *albinus*, Kirsch., *Mitth. Mus. Dresden* I. p. 112. n. 4 (1877) (Twiorage; Waweji; Dorey; Nappan) (an *P. fuscus beccarii* Oberth.?).

♂ ♀, *Papilio albinus* var. *sekarensis* Honrath, *Berl. Ent. Zeit.* XXIX. p. 275 (1885) (Sekar, N. Guinea occ.).

The differences between *P. albinus* and *P. fuscus beccarii*, though rather slight, seem to be constant. The *male* of *P. albinus* has the scales of the outer half of the forewings on the upperside, especially towards the hinder angle, conspicuously longer, so that the scaling appears more irregular, and the serial arrangement of the scales almost imperceptible. There are no blue scales behind the white area. The white discal markings on the underside of the hindwings stand closer to the cell than in *P. fuscus beccarii* Oberth. in either sex; the second, third, and fourth spots are exteriorly rather deeply emarginate, so as to make the anterior angle of each spot sharp. The anal valves of the *male* are more triangular than in *P. fuscus beccarii* Oberth.

This is all I can find by which to distinguish my specimens of *P. albinus* from *P. fuscus beccarii* Oberth. I must add that the distribution of *P. albinus*, which inhabits the whole of New Guinea, is also different from that of *beccarii*, which flies in Dutch and German New Guinea, and is replaced in British (South) New Guinea by *P. fuscus indicatus* Butl. It is, however, not impossible that *P. albinus* is nevertheless a form of *beccarii* which is localised in a certain sense, being confined perhaps to swamps, while *P. fuscus beccarii* and *indicatus*, which are so close allies of the Australian *P. fuscus capaneus*, may inhabit dryer localities.

To *P. albinus* belong two geographical races:—

(a): *P. albinus* Wall., forma typ. [♂, ♀].

The white area of the hindwings is in six out of my seven specimens much larger than in *P. fuscus beccarii*, entering the cell as far as the origin of the middle median nervule; in the seventh specimen (♀) it is not larger than in certain *beccarii*; sometimes it is extended along the costal margin towards the base. The hindwings have above mostly an orange anal spot, and sometimes one submarginal lunule; below, the discal white markings vary in number from 5 to 2 in the *male*; in the *female* the series is complete, but the last spot is almost obliterated; the submarginal spots vary in the *male* from 7 to 0, in the other sex the series is complete.

Honrath's var. *sekarensis* is identical with typical *albinus*; he distinguishes his "var." from *P. albinus* by the absence of a white subapical band from the forewings, and the larger and more numerous white spots on the underside of the hindwings; probably Honrath mistook the following aberration or *P. fuscus beccarii* Oberth. for typical *P. albinus* Wall.

(a²): ab. *lesches* Godm. & Salv.

Papilio lesches Godman & Salvin, *P. Z. S.* p. 614 (1880) (N. of Pt. Moreby, N. Guinea); Salvin, *Ent. Mo. Mag.* XXIV. p. 275 (1888) (*P. bicolor* Kirby = *P. lesches* Godm. & Salv.).
Papilio bicolor Kirby, *Ann. Mag. N. H.* (5). XIX. p. 361 (1887) (N. Guinea); id. & Grose Smith, *Rhop. Ex. I. Pap.* p. 7. t. 3. f. 3 (♂). 4 (♀) (1888).

Forewings with a subapical white band above and below.

If this form, which I have seen only from Southern New Guinea, is confined to that district, and if *P. albinus* is a distinct species, *P. lesches* ought to stand as a subspecies and not as an aberration.

(b²): ab. *leucophanes* Grose Smith.

♂. *Papilio leucophanes* Grose Smith, *Nor. Zool.* p. 584. n. 8a (1894) (Humboldt Bay, New Guinea).
 Hindwings below with two white discal spots only.

Hab. New Guinea: Humboldt Bay (W. Doherty, September to October 1892) (3 ♂, 2 ♀); Sekar, Amberbaki, Dorey, etc.; Twiorage (Meyer, May 1873) (1 ♂); Pt. Moresby, Redsear Bay (British New Guinea) (1 ♂, ab. *lesches*).

(b): ***P. albinus thomsoni*** Butl. [♂, ♀].

♂. *Papilio thomsoni* Butler, *Ann. Mag. N. H.* (5). XIII. p. 197. n. 46 (1884) (Key Dulan).
 ♂ ♀. *Papilio langeni* Druce, *Ann. Mag. N. H.* (6). II. p. 234 (1888) (Key Is.).
 ♂ ♀. *Papilio beccarii*, Rober, *Tijdschr. v. Ent.* XXXIV. p. 273 (1891) Key Is.) (*haec spec. aut P. fuscus rotalita* Swinhoe?).

Differs from *P. albinus* Wall. in the total, or almost total, absence of white discal markings from the underside of the hindwings; in two of my three specimens there are a number of white scales in the places where in *P. albinus* the three anterior white spots stand; this fact, together with the hindwings of *P. albinus* ab. *leucophanes* Gr. Smith being bimaculate with white below, proves that *thomsoni* is not specifically different from *albinus*.

The white discal area of the upper surface of the hindwings is rather variable in breadth; sometimes it does not extend into the cell as far as to the origin of the upper median nervule, in other individuals it reaches to the origin of the second median nervule. My *female* has on the hindwings above, besides the spot at the anal angle, three submarginal orange lunules; in the *male* there is no orange spot marked on the upperside, or only the anal one.

Hab. Key Islands (2 ♂, 1 ♀).

VIII. ORITAS-GROUP.

Both sexes similar, tailless.

81. ***Papilio oritas*** Godm. & Salv. [♂, ♀].

Papilio oritas Godman & Salvin, *P. Z. S.* p. 654 (1879) (N. Ireland).

The position of the straight subapical band of the forewings is not always the same; in most specimens the band is situated between the apex of the cell and the

base of the fifth subcostal nervule; in others it stands farther from the cell, its inner edge being almost on a level with the origin of the fifth subcostal vein. The *female* has a complete series of submarginal spots to the underside of the hindwings; the *male* has no submarginal spots, or only one.

Hab. New Ireland (2 ♂, 2 ♀).

82. *Papilio websteri* Grose Smith [♂, ♀].

♂. *Papilio ormeus*, Pagenstecher (*in* Guérin, 1829), *Jahrb. Nass. Ver. Nat.* p. 70. n. 4 (1894) (*this species according to the specimen examined by us*).

♂. *Papilio websteri* Grose Smith, *Ann. Mag. N. H.* (6). XIII. p. 496 (♂, *nee* ♀) (1894) (New Britain); *id.* & Kirby, *Rhop. Ecol. I. Pap.* p. 37. t. xv. f. 1 (1895) (♂, *nee* ♀).

♂. Differs from *P. oritas* especially in the band of the forewings being more curved and consisting of much smaller spots, and in the hindwings below having a more or less complete series of orange, submarginal markings.

The white discal patch of the hindwings above extends sometimes almost to the base of the lower median nervule; in other examples it reaches just to the origin of the second median vein.

♀. The *female* described and figured by Mr. Grose Smith does not belong to this species, but to a local form of *P. ormeus* Guér. The true *female* of *P. websteri* is similar to the *male* (as in all the allied species), but browner. The patch of the hindwings is more restricted, and there is, besides an anal orange-red spot, a submarginal spot of the same colour between the lower median nervules. Below, the hindwings have a series of six discal white patches, of which the first is lunate and stands behind the subcostal vein midway between outer margin and cell, the second and fourth are about twice as long as broad, the fifth is smaller, the sixth consists of dispersed scales, the third is the largest, being almost thrice as long as broad; the third patch stands about 4 mm. from the end of the cell. The submarginal spots are larger than in the *male*.

Hab. New Britain (10 ♂, 1 ♀).

Note.—The sexes of *P. erskinei*, *laarchus*, *ptolychus*, *woodfordi*, *oritas*, *websteri*, are, as in all other species of *Papilio*, distinguishable from one another by some differences in scaling. The scales of the white markings of the forewings above are much longer and narrower in the *male*, and have less teeth at the apex, and the scales of the upper layer in the black portion of the outer half of the upper surface of the forewings are also longer in the *male*, at least partly, and assume often a hairlike character.—K. J.

83. *Papilio erskinei* Mathew [♂].

Papilio erskinei Mathew, *P. Z. S.* p. 348. t. 34. f. 1 (♂) (1886) (Ugi I., Solomon Is.).

One specimen only is known. It differs from the other species with the band of the hindwings not extending along the costal margin towards the base in the forewings being marked almost exactly as in *P. hecaterus* Godm. & Salv., which is one of the sexually dimorphic species of the Solomon Islands.

Hab. Solomon Islands: Ugi Island (in coll. Godman & Salvin).

84. *Papilio laarchus* Godm. & Salv. [♂, ♀].

Papilio laarchus Godman & Salvin, *Ann. Mag. N. H.* (6). I. p. 214 (♀) (1888) (Rubiana I.) Grose Smith & Kirby, *Rhop. Ecol. I. Pap.* p. 17. t. 8. f. 1. 2 (♂) (1889).

As I must treat *P. ariel* Grose Smith as a subspecies of *laarchus*, there are two geographical races of this insect known :—

(a): **P. laarchus** Godm. & Salv., forma typ. [♂, ♀].

♂. The forewings have an oblique subapical white band above and below: towards the outer third of the inner margin there stands a cloud of white scales or a rather large patch; a second white patch is found in many specimens on the lower median nervule; and in one of my examples these two markings are merged together and form a band which corresponds to the posterior part of the band of *P. woodfordi* Godm. & Salv. The anal orange spot is often absent.

Below, the hindwings have, besides the large anal mark, from 0 to 4 submarginal spots; on the disc there is often a series of bluish spots, inside which stand in many individuals some whitish markings; of the latter those between the subcostal and lower discoidal veins are often rather large and lunate.

♀. On the *upperside*, the hindwings have sometimes an orange submarginal spot between the lower median nervules; below, they have always a complete series of submarginal markings, which vary, however, much in size.

Hab. Solomon Islands: New Georgia (Rubiana) (25 ♂, 9 ♀).

(b): **P. laarchus ariel** Grose Smith [♂].

Papilio ariel Grose Smith, *Ent. Mo. Mag.* XXV. p. 303 (♂) (1889) (Isabel I.); id. & Kirby, *Rhop. Exot.* I. *Pap.* p. 15. t. 13. f. 1. 2 (♂) (1890).

One specimen is known. It differs from *P. laarchus* Godm. & Salv. in the much smaller subapical spots of the forewings, and in the two complete series of discal spots on the underside of the hindwings.

As the subapical spots of the forewings are not constant in size in *P. laarchus*, and as both the blue and the whitish spots of the hindwings beneath are often partly well marked in that species, I cannot accept *P. ariel* as a distinct species.

Hab. Solomon Islands: Isabel Island (in coll. Grose Smith).

85. **Papilio ptolychus** Godm. & Salv. [♂, ♀].

♂. *Papilio ptolychus* Godman & Salvin, *Ann. Mag. N. H.* (6). I. p. 99 (1888) Guadalcanar I.

♂. Differs from *P. laarchus* Godm. & Salv. especially in the forewings having four white spots posteriorly close to the outer margin, besides the subapical white band, and in the band of the hindwings being as narrow as in *P. bridgei* Mathew.

Some specimens have on the *upperside* of the hindwings a small, ochraceous, submarginal spot between the lower median nervules; below, the series of submarginal spots is always complete, but the spots are often very feebly marked.

♀. Similar to the *male*; the marginal spots to the forewings and the submarginal markings to the under surface of the hindwings are rather larger; above, the hindwings have three submarginal spots in my single example.

Hab. Solomon Islands: Guadalcanar Island (9 ♂, 1 ♀).

86. **Papilio woodfordi** Godm. & Salv. [♂, ♀].

Papilio woodfordi Godman & Salvin, *Ann. Mag. N. H.* (6). I. p. 100 (1888) (Alu & Fauro, Solomon Is.); Grose Smith & Kirby, *Rhop. Exot.* I. *Pap.* p. 21. t. 10. f. 1. 2 (♂) (1890).

The broad white band of the forewings is divided in certain specimens longitudinally from the second discoidal nervule to the inner margin of the wing by means

of a blackish band; the inner portion of the white band, which is narrow and continuous with the portion near the apex of the cell, is often obliterated, and then the band is interrupted before the upper median nervule. The position of the posterior part of the white band is not always the same, the black marginal area varying in breadth from 5 to 10 mm. at the lower median nervule.

The hindwings are in some individuals more strongly toothed at the end of the upper median vein than in others: there is no orange anal mark, as in *P. polychus*, but often a small white anal spot.

The markings of the underside are rather variable. The forewings exhibit often small and ill-defined submarginal white spots, which in some individuals form a kind of submarginal band. The submarginal spots of the hindwings vary in number, shape, and colour.

♀. All my specimens have an orange anal spot on the upperside of the hindwings, which is sometimes larger than in *P. polychus*; one example has also some submarginal markings on the hindwings above. Below, the submarginal marks of the hindwings are larger than in the *male*, though they vary in size, and are mostly of an orange-yellow colour.

Hab. Solomon Islands: Shortland Islands (Alu, Fauro) (10 ♂, 6 ♀).

IX. GAMBRISIUS-GROUP.

Sexes tailless, dissimilar (sexually di- or polymorphic species).

87. (?) *Papilio amphitriton* Cram.

Papilio Eques Achivus amphitriton Cramer, *Pap. Ec.* I. p. 10. t. 7. f. A. B (1775) (America! *loc. err.*); Fabr., *Syst. Ent. Suppl.* p. 253. n. 60 (1776) (*p.p.*); Goeze, *Ent. Beytr.* III. 1. p. 75. n. 20 (1779); Fabr., *Spec. Ins.* p. 24. n. 96 (1781) (*p.p.*); id., *Mont. Ins.* p. 12. n. 112 (1787) (*p.p.*); Jablonsky & Herbst, *Naturs. Schm.* III. p. 96. n. 78. t. 31. f. 1 (1788); Fabr., *Ent. Syst.* III. 1. p. 37. n. 111 (1793) (*p.p.*).

Nestorides amphitriton, Hübner, *Verz. bek. Schm.* p. 86. n. 800 (1816).

Papilio amphitriton Godart, *Enc. Meth.* IX. p. 30. n. 13 (1819) (Amboina); Gray, *Cat. Lep. Ins. B. M. I.* p. 23. n. 101 (1852); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 58. n. 76 (1865); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 254. n. 65 (1869).

Papilio amphitryon De Haan, *Verh. Nat. Gesch. Ned. orerz. bez.* p. 32 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 79 (1846).

Papilio amphitriton, Felder, *Verh. z. b. Ges. Wien* p. 321. n. 419 (1864).

The figure which Cramer gives of his *amphitriton* differs from *gambrisius* especially in the pattern of the underside of the hindwings; specimens agreeing with Cramer's figure are unknown to science. Boisduval (*l.c.*) describes as *amphitriton* an insect which is, according to a typical specimen in Mr. Oberthür's collection, a variety of *gambrisius* and not *amphitriton* Cram. As Cramer refers to Seba (t. 8. f. 7. 8) and gives as habitat "America," while Seba says "India occidentalis," and as, further, the nomenclature of the figure is erroneous, I cannot help thinking that Cramer's figure was, if taken from nature, drawn from a mutilated and painted-up specimen, perhaps from the same specimen from which Seba's figures are taken: we know that Cramer purchased a number of specimens of Seba's collection some forty years after Seba's plates were drawn, and it is most probable that Cramer's figures of *P. amphitriton* as well as of *Troides hypolitus* (t. 10. f. A. B) (see p. 200) were drawn up from Seba's (strongly mutilated) individuals and restored with the help of Seba's figures. Anyhow, Cramer's *amphitriton* must for the present remain a doubtful species.

88. *Papilio gambrisius* Cram. [σ , φ].

- Seba, *Theat.* IV. p. 12. t. 8. f. 7. 8 (σ) (1765) (*Ind. occ.*; an *P. amphitriton* Cram. ?); id., t. 14. f. 19 & 20 (φ) (1765) (Amboina).
- σ . *Papilio Eques Achirus gambrisius* Cramer, *Pap. Ex.* II. p. 95. t. 157. f. A. B (1779) (Amboina); Goeze, *Ent. Beytr.* III. 1. p. 85. n. 60 (1779); Jablonsky & Herbst, *Naturs. Schmetz.* III. p. 92. n. 77. t. 33. f. 2. 3 (1788).
- Papilio Eques Achirus amphitriton*, Fabricius, *Syst. Ent. Suppl.* p. 253. n. 60 (1775) (*p.p.*); id., *Spec. Ins.* p. 24. n. 96 (1781) (*p.p.*); id., *Mant. Ins.* p. 12. n. 112 (1787) (*p.p.*); id., *Ent. Syst.* III. 1. p. 37. n. 111 (1793) (*p.p.*).
- φ . *Papilio Eques Achirus fusconiger* Goeze, *Ent. Beytr.* III. 1. p. 88. n. 74 (1779) (*type*: Seba l.c. t. 44. f. 19. 20).
- φ . *Papilio Eques Achirus drusius* Cramer,* *Pap. Ex.* III. p. 63 & 64. t. 229. f. A. & t. 230. f. A (1782) (Amboina); Jablonsky & Herbst, *Naturs. Schmetz.* III. p. 89. n. 76. t. 33. f. I (1788); Esper, *Ausl. Schmetz.* p. 194. n. 87. t. 47. f. 2 (1785-98).
- σ . *Papilio amphitriton*, Beauvais, *Ins. Afr. & Amér.* p. 208. t. 2e. f. Ia. 1b (1805) ("St. Domingo" *err. loci*).
- φ . *Nestorides drusius*, Hübner, *Verz. bek. Schm.* p. 86. n. 888 (1816).
- σ . *Nestorides gambrisius*, Hübner, *Verz. bek. Schm.* p. 86. n. 889 (1816).
- σ . *Papilio gambrisius*, Godart, *Enc. Meth.* IX. p. 31. n. 14 (1819); Boisduval, *Spec. Gén. Léop.* I. p. 213. n. 29 (1836) (Amboina); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 75 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 22. n. 96 (1852); Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 30 (1860) (*p.p.*).
- φ . *Papilio drimachus* Godart, *Enc. Meth.* IX. p. 31. n. 16 (1819) (Amboina).
- φ . *Papilio drusius*, Boisduval, *Spec. Gén. Léop.* I. p. 218. n. 34 (Amboina); " φ of *gambrisius* Cram. ?"; De Haan, *Verh. Nat. Gesch. Ned. oerz. bez.* p. 31 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 80 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 23. n. 102 (1852); Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 31 (1860) (Amboina).
- σ φ . *Papilio gambrisius*, Felder, *Verh. z. b. Ges. Wien* p. 320. n. 417. & p. 368. n. 247 (1864) (Amboina; Ceram); Wall., *Tr. Linn. Soc. Lond.* p. 58. n. 75 (1865) (Amboina; Ceram; Burn); Oberth., *Et. d'Ent.* IV. p. 50. n. 90 (1879) (Bura); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 203 (1884); Standing. & Schatz, *Exot. Schm.* I. p. 7 (1884); Ribbe, *Iris* II. p. 209. n. 9 (1890) (Ceram); Haase, *Unters. üb. Mm.* p. 42 (1893).

σ . The spots in the apical region of the forewings are variable in number and size; one of my Ceramese specimens has only two spots, situated between the discoidal nervules, of which the posterior one is minute. The white area of the hindwings occupies about the apical fourth of the cell in some examples; in others, chiefly in those from Ceram, it just penetrates into the apex of the cell. On the underside of the hindwings the two discal series of ill-defined spots are sometimes complete, sometimes they are partly obsolete; the orange spot near the anal angle is very variable in size. The forewings have a length of 80 mm. in my largest, of 58 mm. in my smallest specimen.

(a^2): σ -ab. *abbreviatus* nom. nov.

- σ . *Papilio amphitriton* Boisduval (*sec* Cramer, 1775), *Spec. Gén. Léop.* I. p. 217. n. 33 (1836) (Celebes); Oberth., *Et. d'Ent.* IV. p. 50. n. 91 (1879) (*one of Boisduval's specimens*).

Band of the hindwings abbreviated behind, consisting of seven (inclusive of the cellular one) instead of eight patches.

This form is said to be from Celebes; no specimens have been found since 1836. If *abbreviatus* really inhabits the island of Celebes, it must stand as a subspecies.

φ . The breadth of the white band of the hindwings varies obviously; Mr. Ph. Crowley possesses a specimen in which the band is so narrow that the spot between the subcostal and the upper discoidal veins is three times as long (transversely) as

* *P. drusius* Cram. is already enumerated by Goeze in his *Ent. Beytr.* III. 2. *Verrede*, which is dated "Vor der Michaelismesse, 1780." Which is the proper date of publication of Cramer's Vol. III. ! K. J.

broad. The submarginal spots on the underside of the hindwings are feeble and partly obliterated in a ♀ from Saparua Island.

Hab. Southern Moluccas: Amboina (♂ ♂, 1 ♀), Saparua (2 ♀), Ceram (2 ♂, 2 ♀), Buru (1 ♂).

In the Felderian collection are a ♂ and a ♀ labelled "Type, Cramer, coll. Lennepe"; these specimens agree well with Cramer's figures, but I must doubt that they really are Cramer's types; Cramer mentions sometimes the collection of Lennepe, and some of Lennepe's specimens are indeed figured by Cramer; but most of Lennepe's specimens, which Felder obtained at a sale in Holland, do not exactly agree with Cramer's figures of the respective species.

89. *Papilio tydeus* Feld. [♂, ♀].

Papilio tydeus Felder, *Wien. Ent. Mon.* IV. p. 229. n. 74 (♂) (1860) (Batjan); id., *Verh. z. b. Ges. Wien* p. 321. n. 422 (1864) (Batjan: Morotai: Halmahera); id., *Reise Norwa, Lep.* I. p. 111. n. 85. t. 16. f. c (♂). t. 17. f. a (♂). b. c (♀) (1865); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 57. n. 73. t. 4. f. 2 (♀). 3 (♂) (1865) (Batjan: Moroty); Oberth., *Et. d'Ent.* IV. p. 50. n. 89 (1879) (Ternate; Halmahera); id., *Ann. Mus. Civ. Gen.* XV. p. 473. n. 14 (1880) (Ternate; "Amdai" loc. err.); Stauding. & Schatz, *Exot. Schmett.* I. p. 7 (1884); Haase, *Unters. üb. Min.* p. 43 (1893).

Both sexes are very constant in comparison with the allied species.

♂. The white band of the hindwings does not touch the apex of the discoidal cell; the submarginal ochreous orange spots on the underside of the hindwings are dilated inwardly along the nervules; the three anterior ones are sometimes less clearly marked; the number and size of the subdiscal blue and grey markings are inconstant.

♀. One form of this sex is known, which is allied to the pale form of *P. aegeus ornaenus* Guér; it is at once distinguishable from the latter by the shape of the submarginal spots of the hindwings.

Hab. Northern Moluccas: Batjan (W. Doherty, March 1892) (♂ ♂, 2 ♀), Ternate, Halmahera (W. Doherty, August 1892) (10 ♂, 7 ♀), Morotai (1 ♂).

90. *Papilio aegeus* Don. [♂, ♀, metam.].

- ♀. *Papilio aegeus* Donovan, *Lus. of N. Holl.* texte & pl. 14 (1805) (N.S. Wales); Godart, *Enc. Meth.* IX. p. 32. n. 17 (1809).
- ♂. *Papilio eretheus* Donovan, *l.c.* texte & pl. 15 (1805); Godart, *l.c.* p. 31. n. 15 (1819); Lucas, in Chenu's *Enc. d'Hist. Nat., Pap.* t. 4. f. 2 (1851).
- ♀. *Nestorides aegus*, Hübner, *Samml. Ex. Schm.* II. t. 108 (1816-36).
- ♂. *Nestorides eretheus*, Hübner, *l.c.* t. 109 (1816-36).
- ♂ ♀. *Papilio aegus*, Felder, *Verh. z. b. Ges. Wien* p. 321. n. 421. & p. 368. n. 249 (1864) (Australia); Semper, *Journ. Mus. Godeffr.* Heft 14. p. 42. n. 132 (Separ.) (1878) (N.S. Wales; Pt. Denison; Bowen; Gayndah; Peak Downs; Cape York); Stauding. & Schatz, *Exot. Schm.* I. p. 7. t. 4 (♂, ♀) (1884).
- ♂ ♀. *Papilio eretheus*, Lucas, *Lép., Exot.* p. 17. t. 9. f. 1 (1835); Boisdu, *Spec. Gén. Léop.* I. p. 215. n. 31 (1836) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 77 (1846) (Australia); Gray, *Cat. Lep. Ins. B. M.* I. p. 22. n. 99 (1852) (*evol. of var. b.*); Oberth., *Et. d'Ent.* IV. p. 49. n. 87 (1879); Mathew, *Proc. Linn. Soc. N.S. Wales* p. 264 (1885) (Thursday I.); id., *Ent. Mo. Mag.* p. 235 (1885); id., *Tr. Ent. Soc. Lond.* p. 172 (1888) (life hist.); Olliff, *Ann. Mag. N. H.* (6). I. p. 359 (1888) (life hist.); id., *Proc. Linn. Soc. N.S. Wales* p. 395 (1888) (Mount Belender-Ker, Queensland); id., *l.c.* p. 1252. fig. (1888) (*ab. of ♀*); Edwards, *Vict. Natur.* VIII. p. 20 (1891) (life hist.).
- ♂ ♀. *Papilio gambrisius*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 30 (1840) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 30 (1860) (*p.p.*).
- ♂ ♀. *Papilio eretheus*, Koch, *Indo-Austr. Lep. Fauna* p. 41 (1866); Haase, *Unters. üb. Min.* p. 42 (1893).

My endeavours to find constant differences between *P. aegeus* Don., *ormenus* Guér., *adrastus* Feld., *pandion* Wall., and *othello* Grose Smith did not meet with success; the distinguishing characters, as they are pointed out by Wallace, Felder, and Grose Smith, are not of specific value, since they do not apply to all the specimens from the respective localities, and appear also in specimens from other places. Four local races are, however, pretty well distinguishable, though it is often difficult and even impossible to say to which race a specimen without locality belongs:—

- (a): *P. aegeus* Don. from Australia and the islands between Queensland and New Guinea (occurring also in British New Guinea?);
- (b): *P. aegeus ormenus* Guér. from New Guinea and the adjacent islands; Waigen; Key; Aru; Woodlark(?);
- (c): *P. aegeus adrastus* Feld. from the Banda Islands;
- (d): *P. aegeus bismarckianus* subsp. nov. from New Britain.

Wallace's *P. pandion* is not separable subspecifically from *P. aegeus ormenus* Guér.; both these forms flying together, and being connected by every intergraduate, *pandion* must be treated as a mere aberration.

Grose Smith's *P. othello* is based on an extreme *male* of ab. *pandion*, and on two *females*, belonging to two different forms, which were obtained by Mr. W. Doherty on the island of Biak, Geelvink Bay; though one of the *females* (♀-ab. *polydorinus* Haase) is, indeed, aberrant in having the submarginal red spots on the upperside of the hindwings very much reduced in size and the white patches on the forewings much purer white, I cannot believe that the island of Biak, which is so close to the main islands of New Guinea, is inhabited by a race of its own; the *male* and the second *female* (♀-ab. *amangu* Boisd.) do not differ from certain New Guinea specimens.

Montrouzier's *P. ormenus*, from Woodlark Island, may be different from *P. aegeus ormenus* Guér.; but as Montrouzier's description (of the *females*) is not sufficient to enable one to tell any difference between the Woodlark and the New Guinea *Papilio*, I think it best to put the Woodlark *Papilio* as a query synonym to *P. aegeus ormenus* Guér.

P. gumbrius Cram., *P. lydeus* Feld., and *P. inopinatus* Butl. are close relatives of *P. aegeus* Don., but are constantly different, and have therefore to stand as distinct species. These species are monomorphic in either sex, and so is *P. aegeus* Don. and *P. aegeus adrastus* Feld., while *P. aegeus ormenus* Guér. is polymorphic. This highly interesting, but now well-known fact, that a species is so very variable in one part of its range, whereas it is comparatively constant in others, is exemplified by many other *Papilios*, of which I mention here a few:—

Papilia clytia L., which is polymorphic in India, is monomorphic on the Andaman Islands, Palawan, and the Philippines; its nearest ally (*P. echidna* De Haan) is also monomorphic. In *P. menemon* L. and *agenor* L. the *female* is remarkably polymorphic; in the Loo Choo Islands, however, occurs only one form of this sex. The *female* of *P. rumanzovius* Eschsch. is polymorphic on the Philippines, monomorphic on Sangir Island; etc.

- (a): **P. aegeus** Don., forma typ. [♂, ♀, metam.].

♂. The subapical white band on the forewings is always present and rather constant in form. The length of the costal portion of the white band of the hindwings is variable; this band enters sometimes the apex of the cell, in none of my specimens it extends beyond the lower median vein; the anal vermilion spot is always present above and below.

On the underside the submarginal series of vermilion spots is nearly always complete, but the spots are very variable in size; the blue lunules stand closer to the vermilion spots than in the other subspecies of *P. aegeus*, and the bullish lunules are on a level with the anal spot, whereas in *P. aegeus ormenus* and *adrastus* they are in most specimens situated farther towards the cell.

♀. Monomorphic. The single character by which the *females* from *Australia* are distinguishable from those of *ormenus* and *adrastus* is the white area of the hindwings being extended on the underside to the costal margin, or at least being connected with that margin by means of a thin white arched line. This line is not present in any of my New Guinea examples, but it is almost obliterated in certain specimens from North Queensland.

Hab. Australia: New South Wales (7♂, 5♀); Victoria; Queensland (25♂, 15♀); Torres Straits (Thursdays Island, 1♀); (?) British New Guinea.

(b): *P. aegeus ormenus* Guér. [♂, ♀].

- ♂. *Papilio ormenus* Guérin, *Voy. Cochin* t. 14. f. 3 (1829); Boisduval, *Voy. Astrol.*, *Lép.* p. 39. n. 4 (1832) (Olfak): id., *Spec. Gén. Lép.* I. p. 214. n. 30 (1836) (New Guinea); Guérin, *l.c.* texte III. p. 274 (1842) (Olfak): Doubl. Westw. & Hew., *Gen. Diurn. Lép.* I. p. 12. n. 76 (1846): Gray, *Cat. Lep. Ins. B. M.* I. p. 22. n. 77 (1852); id., *List Lep. Ins. B. M.* I. p. 29. n. 104 (1856).
- ♀. *Papilio amanga* Boisduval, *Voy. Astrol.*, *Lép.* p. 39. n. 3 (1832) (New Guinea); id., *Spec. Gén. Lép.* I. p. 216. n. 32 (1836); Doubl. Westw. & Hew., *l.c.* p. 12. n. 78 (1846): Gray, *Cat.*, etc. p. 23. n. 100 (1852): id., *List*, etc. p. 30. n. 107 (1856).
- ♂ ♀. *Papilio gambriensis*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 30 (1840) (*p.p.*): Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 30 (1860) (*p.p.*).
- ♀. *Papilio onesimus* Hewitson, *Exot. Butt.* II. *Pap.* t. 3. f. 8 (1858) (New Guinea).
- ♂ ♀. *Papilio ormenus*, Felder, *Wien. Ent. Mon.* III. p. 265. 267 (1859): id., *l.c.* IV. p. 229 (note) (1860) (Aru Is.): id., *Verh. z. b. Ges. Wien* p. 320. n. 417. & p. 368. n. 248 (1864) (? *cert. of Woodlark I.*): Wall., *Tr. Linn. Soc. Lond.* XXV. p. 55. n. 71. t. 3. f. 1. 2. 3. 4 (♂, ♀ ♀) (1865) (Waigen: Aru: Key: Matabello: Goram): Kirsch, *Mitth. Mus. Dresden* I. p. 112. n. 6 (1877) (New Guinea): Obertb., *Et. d'Ent.* IV. p. 49. n. 88 (1879) (New Guinea: Aru): id., *Ann. Mus. Civ. Genova* XV. p. 473. n. 15 (1880) (Aru: New Guinea): Stauding. & Schatz, *Exot. Schmett.* I. p. 7 (1881): Ribbe, *Iris* p. 78. n. 6 (1886) (Aru Is.): Röber, *Tijdschr. v. Ent.* p. 273 (1891) (Key: Goram): Haase, *Unters. üb. Mim.* p. 42 (1893): Stauding., *Iris* VII. p. 107 (1894) (*ormenus* Guér. is a local form of *P. aegeus* Don.).
- ♀. *Papilio adrastus* Felder, *Verh. z. b. Ges. Wien* p. 321. n. 420 (1864) (*p.p.*; *nom. nud.*): id., *Reise Novara, Lep.* I. p. 110. n. 84. t. 16. f. b (1865) (♀, *nec* ♂) (New Guinea): Butl., *P. Z. S.* p. 471 (1877) (New Guinea): id., *Ann. Mag. N. H.* (4). XX. p. 125. n. 24 (1877) (New Guinea).
- ♂ ♀. *Papilio pandion* Wallace, *l.c.* p. 56. n. 72 (1876) (New Guinea: Salwatty: Mysol): Butler, *P. Z. S.* p. 471 (1877) (New Guinea): Kirby, *Ann. Mag. N. H.* (6). IV. p. 166. n. 18 (1889) (Louisiane Arch.).
- ♀. *Papilio aegeus*, Kirsch, *Mitth. Mus. Dresden* I. p. 112. n. 7 (1877) (Ansus: Kordo).
- ♀. *Papilio erectheus*, Godman & Salvin, *P. Z. S.* p. 648 (1878) (Brit. New Guinea).
- ♀. *Papilio ormenus* var. *adrastus*, Oberthür, *Et. d'Ent.* IV. p. 50. sub n. 88 (1879) (Dorey: Andai): id., *Ann. Mus. Civ. Genova* XV. p. 473. sub n. 15 (1880) (Andai).
- ♀. *Papilio ormenus* var. *amanga*, Ribbe, *Iris* p. 78. n. 7 (1886) (Aru Is.).
- ♂ ♀. *Papilio erectheus*, Mathew, *Tr. Ent. Soc. Lond.* p. 176 (1888) (Brit. New Guinea).
- ♂ ♀. *Papilio gambriensis* var. *ormenus*, Snellen, *Tijdschr. v. Ent.* XXXII. p. 395 (1889) (Rou: Andai).
- ♀. *Papilio ormenus* var. *polydorina* Haase, *l.c.* p. 42 (1893).
- ♂ ♀. *Papilio othello* Grose Smith, *Nor. Zool.* I. p. 332. n. 3 (1894) (Biak I.): Stauding., *Iris* VII. p. 104 (1894) (*othello* Grose Smith = *pandion* Wallace).
- (?) ♂ ♀. *Papilio ormenus*, Montrouzier, *Ann. Sc. Phys. Nat. Lyon* p. 394 (1856) (Woodlark I. common): id., *Essai s. l. Faune d. Woodl.* (Separ.) p. 117 (♂ ♀) (1857).
- (?) ♀. *Papilio godarti* Montrouzier, *Ann.*, etc. p. 398 (♀, *nec* ♂) (1856) (Woodlark I.): id., *Essai* etc. p. 120 (♀, *nec* ♂) (1857).

♂. Distinguishable from *P. aegeus* and *P. aegeus adrastus* by the broader white

area of the hindwings, which, moreover, extends beyond the lower median nervule; in my ♂ from the Key Islands the band just reaches that vein, as in *adrastus* and *aegeus*. The anal orange-chrome spot of the hindwings is frequently present above; the submarginal spots of the underside of the hindwings vary in number; the series is seldom complete.

The grey scaling in the apical region of the underside of the forewings, by the absence of which Wallace distinguished the Waigen examples from those from New Guinea, is equally developed in specimens from both localities; sometimes the grey streaks are more, sometimes less conspicuous; seldom they are quite absent.

According to the development of the white subapical band of the forewings one may differentiate three aberrations of the *male*:—

(*a*²): Typical *ormenus* Guérin, *l.c.*

Band broad.

(*b*²): ♂-ab. *pandion* Wallace, *l.c.*

Spots composing the band reduced in size, partly obsolete.

(*c*²): ♂-ab. *othello* Grose Smith, *l.c.*

Band absent from the upperside.

I have the two first forms from Waigen, all three from the mainland of New Guinea; my ♂ from the Key Islands belongs to ♂-ab. *pandion*, those from Aru to *ormenus*; in one of the latter the band consists of three rather large spots.

♀. Polymorphic. There are four principal forms which run into one another:—

(*d*²): ♀-ab. *inornatus* ab. nov.

Forewings entirely brown above. Type from the coast near Arfak.

(*e*²): Typical *ormenus* Guérin; Wallace, *l.c.* t. 3. f. 1.

Similar to the *male*, but the white area of the hindwings convex interiorly, and not extended towards the base anteriorly.

This form seems to me to be confined to Waigen. Oberthür, *l.c.*, records under this name a specimen from Amberbaki, New Guinea, which has no subapical white band on the forewings.

(*f*²): ♀-ab. *polydorinus* Haase, *l.c.*; Wallace, *l.c.* t. 3. f. 3.

Similar to the ♀ of *P. aegeus* Don., but the white patch of the hindwings does not extend beyond the subcostal nervule.

Light parts of the forewings often rather white; white patch of hindwings variable in size; submarginal chrome-orange spots also very variable.

This form is known from Waigen, Aru, Key, New Guinea, and adjacent islands.

(*g*²): ♀-ab. *amanaga* Boisdu., *l.c.* (syn.: *onesinus* Hew., *l.c.*); Wallace, *l.c.* t. 3. f. 4.

Outer half of the forewings, except the margins, white or whitish. Hindwings very variable in pattern; white, with base, anterior and outer borders black; with a series of submarginal spots which are often partly or entirely absent, sometimes enlarged and confluent posteriorly, and then broadly connected along the nervules with the discal white area.

This form is known from Waigeu, Aru, Key, New Guinea and adjacent islands, and D'Entrecasteaux Islands.

Hab. Waigeu (6 ♂, 6 ♀); Aru (3 ♂, 3 ♀); Key (1 ♂); New Guinea (66 ♂, 61 ♀) and adjacent islands; D'Entrecasteaux Islands (many *mules* and *females* of most of the above enumerated aberrations).

(c): ***P. aegaeus adrastus*** Feld. [♂, ♀.]

(?). ♂. *Papilio creethus*, Blanchard (*see* Guérin, 1829), *Voy. au Pôle Sud*. IV. p. 377. t. 1. f. 1. 2 (1853) (*p.p.*).

Papilio creethus var. b, Gray, *Cat. Lep. Ins. B. M.* I. p. 22. sub n. 99 (1852).

♂. *Papilio adrastus* Felder, *Verh. z. b. Ges. Wien* p. 321. n. 420 (1864) (*p.p.*): id., *Reise Novara*, *Lep.* I. p. 110. n. 84. t. 16. f. a (♂). (*see* fig. b ♀) (1865) (Banda Is.; ♂).

♂ ♀. *Papilio adrastus*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 57. n. 74. t. 4. f. 1 (♀) (1865) (Banda Is.): Stauding., *Iris* VII. p. 107 (1894).

♂. The subapical white band on the forewings is always present, but the spots composing it are more variable in size than in *P. aegaeus* Don. The white band of the hindwings is similar to that of *P. aegaeus*, *i.e.* much narrower than in *P. aegaeus ormenus*, and not extending beyond the lower median nervule. The spot between the subcostal and upper discoidal veins is anteriorly not quite so long as the portion of the subcostal nervule outside this spot. In *P. aegaeus ormenus* it is much longer than that portion of the nervule (the measuring of six specimens gives an average of 10 : 11 in *P. aegaeus adrastus*, against an average of 10 : 5½ in *P. aegaeus ormenus*). The red anal spot seems always to be well developed on both sides of the wing.

On the underside of the hindwings, Felder's type-specimen has a complete series of chrome-orange spots, the middle ones of which are, however, rather feeble; mostly the specimens have, besides the anal mark, only one submarginal spot. The discal bluish lunules, which usually are on a level with the anterior part of the anal spot, stand sometimes farther towards the outer margin, and then are in the same position as in aberrant examples of *P. aegaeus* Don.

♀. Felder's type-specimen of this sex is said to be from New Guinea; it agrees, except in size, exactly with a specimen obtained by W. Doherty in the Banda Islands. Both the Felderian and the Dohertyan specimen differ from the ♀ figured by Wallace (*i.e.* t. 4. f. 1), and from a specimen in Mr. Crowley's collection, in the size and form of the white area of the hindwings and the extension of the white on the forewings; indeed, they are scarcely distinguishable from the Waigeu *female* figured by Wallace (*i.e.* t. 3. f. 1), except by the paler tint of the submarginal spots of the hindwings. But as the colour of these spots is quite the same in most of my Waigeu and New Guinea examples on the one hand, and in the Banda specimens on the other hand, I must confess that I cannot tell any constant difference between *P. aegaeus adrastus*-♀ and *P. aegaeus ormenus* ♀-ab. *polydorinus* Haase. The material of *P. aegaeus adrastus*-♀ is too scarce in collections. In future, when a good series of ♀♀ can be compared, a difference between the two *females* may be found. The name of *adrastus* must be restricted to the specimens from the Banda Islands; Felder's *female* is, therefore, no *adrastus*, but an *ormenus*.

Hab. Banda Islands (W. Doherty, August 1892) (6 ♂, 1 ♀).

(d): ***P. aegaeus bismarckianus*** subsp. nov. [♀].

♀. *Papilio webstri* Grose Smith, *Ann. Mag. N. H.* (6). XIII. p. 496 (♀, *see* ♂) (1894) (New Britain): id. & Kirby, *Rhop. Entom.* II. *Pap.* p. 37. t. xv. f. 2 (1895) (♀, *see* ♂) (1895).

Mr. Grose Smith received this insect, together with a number of *mules*, from New Britain, and described it accordingly as the *female* sex to those *mules* under the

name of *P. websteri*. Recently we obtained again a number of *male websteri* and also some *females* which agree with these *males* exactly in the same way as the *females* of *laurchus*, *oritas*, etc., agree with their *males*, and, therefore, are undoubtedly *websteri-females*. Of the *ormenus*-like *female* described by Mr. Grose Smith we received also two specimens, and I come to the conclusion that this *ormenus*-like *female* represents a New Britain race of *aegeus* of which we do not yet know the *male*. I cannot believe that the insect which I propose to call *bismarckianus* is a second form of the *female* sex of *P. websteri*, as it agrees too well with certain specimens of *P. aegeus ormenus* Guérin, and as it is scarcely probable that one *female*-form of a species agrees with one group of species (with *aegeus*, *hecataneus*, *prospero*, etc., which have *male* and *female* dissimilar), while the other *female* and the *male* agree with another group of species (with *woodfordi*, *laurchus*, *oritas*, etc., which have the sexes similar).

Similar to *P. aegeus ormenus* ♀-*ab. polydorinus* Haase, but the band of the forewings pure white above and below, and more regularly arched; the spot between the upper median veins stands far from the discoidal cell; the posterior or the two posterior spots are broader than long; the spot in the end of the cell is small or (*type*) obliterated above. The white patch on the hindwings is of the same size above and below, and is somewhat larger than in Wallace's fig. 3 of t. 3 (*i.e.*); there is a small white lunule behind the costal margin, as in *P. aegeus* Don. On the upper-side there are two orange submarginal spots, besides an orange anal mark; below, the submarginal spots are much smaller than in the above-cited figure. The two blue spots between the median veins are small, and in the *type* straight, in the second specimen arched, but with the concavity directed towards the disc, not towards the outer margin.

Hab. New Britain (2 ♀).

91. *Papilio inopinatus* Butl. [♂, ♀].

Papilio inopinatus Butler, *P. Z. S.* p. 370. n. 15 (♂, ♀) (1883) (Maroe I., Tenimber Is.); Rober, *Tijdschr. v. Ent.* p. 274 (1891); Grose Smith & Kirby, *Rhop. Exot.* II, *Pap.* p. 27. t. 12. f. 1 (♂). 2 (♀) (1893).

♂. The costal part of the white band on the hindwings is rather variable in length; in the single (damaged) specimen from Babber Island I have, it extends farther to the base of the wing than in any of the Tenimber specimens. The number of the vermilion red and blue spots on the underside of the hindwings is very inconstant; the anal spot is always present below and above. The forewing of my smallest *male* is 48 mm. long, that of my largest 70.

♀. The discal white patch of the allied species is absent from the upper-side of the hindwings; below it is indicated by a variable, buffish, irregular band tinged with tawny. The submarginal spots to the hindwings are very inconstant in size and shape. Varies in the length of the forewings from 58 to 76 mm.

Hab. Tenimber Islands (Timor Laut) (W. Doherty, June to July 1892; Micholitz, February to March 1892) (9 ♂, 8 ♀); Babber Island (Baba) (W. Doherty, July 1892) (1 ♂); Dammer (1 ♂, 1 ♀).

92. *Papilio bridgei* Mathew [♂, ♀].

Papilio bridgei Mathew, *P. Z. S.* p. 349. t. 34. f. 2 (♂) (1886) (Treasury I.); Godm. & Salvin, *Ann. Mag. N. H.* (6). I. p. 214 (1888) (Alu I., Solomon Is.).

Of this species two local forms are known:—

(a) : *P. bridgei* Mathew, forma typ. [♂, ♀].

♂. The type-specimen in the collection of Messrs. Godman & Salvin came from Treasury Island, where Mr. Mathew obtained only this single individual; it is very small, and has the spots of the macular band of the forewings minute. The individuals from the Shortland Islands are much larger than the type, and have the band of the forewings broader. I have, however, one specimen from Alu Island, Shortland Islands, which is inferior in size to Mathew's type, and exhibits the same small spots on the forewings; another individual from Alu stands just intermediate between the type and the usual large Alu form.

The posterior spot of the band on the forewings above, situated behind the submedian vein, and the three anterior ones between costal margin and fifth subcostal nervule, are sometimes obliterated. The band of the hindwings is not quite constant in breadth, especially the posterior patches vary in size; in one of my examples there is a minute white spot in the end of the cell.

Below, the forewings have sometimes a more or less complete series of feeble white submarginal spots. On the disc of the hindwings there stand often, besides the blue markings, some small tawny ochraceous spots between the median and discoidal nervules. In an Alu specimen, collected by Mr. Woodford, the space between the fourth, fifth, and sixth submarginal spots and the corresponding blue discal markings is densely overpowdered with tawny ochraceous scales.

♀. The markings vary from white to buff: they are very inconstant in size, and never so well defined above as in *P. hecataeus* Godm. & Salv. and *prospero* Grose Smith. The marginal spots of the forewings beneath are mostly confluent with the small submarginal spots, and assume the form of the head of a nail (nearly as in the male of *P. polytes* L.). Sometimes these nail-head-shaped spots are also marked above, but in most specimens only the marginal, not the submarginal, spots are present on the upperside.

Though the males of *P. bridgei* Math. are well distinguishable from those of *P. hecataeus* Godm. & Salv. and *prospero* Grose Smith, the females are scarcely different enough to be specifically separated. The only constant character by which I can distinguish *bridgei*-♀ from the same sex of the other two "species" is unimportant enough: the spots of the band on the upperside of the forewings are rather ill defined, and the two spots between the second discoidal and second median veins are rather longer.

Hab. Solomon Islands: Treasury Island, Shortland Islands (15 ♂, 8 ♀).

(b) : *P. bridgei tryoni* Mathew [♂].

♂. *Papilio tryoni* Mathew, *Tr. Ent. Soc. Lond.* p. 315 (1889) (Ugi I., Solomon Is.).

The male only is known. It differs from that sex of *P. bridgei* Mathew in the band of the forewings consisting of five spots instead of seven to ten. I have a specimen from Isabel Island (*teste* Capt. Webster) which has six spots. This proves that *P. tryoni* is not a distinct species.

Hab. Solomon Islands: Ugi Island, Isabel Island (1 ♂).

93. *Papilio hecataeus* Godm. & Salv. [♂, ♀].

♂ ♀. *Papilio hecataeus* Godman & Salvin, *Ann. Mag. N. H.* (6), I, p. 213 (1888) (Guadalecanar I.).

♂. The fifth and sixth spots of the macular band of the forewings are sometimes very small. Below, the subapical spots of the forewings vary much in size: near the

hinder angle stands sometimes a feeble white mark. The series of submarginal spots to the underside of the hindwings seems to be complete in all specimens, though the three anterior ones are occasionally much reduced in size; above, the cell of the hindwings has in two of my individuals a white spot at the apex.

♀. The patch within the cell of the forewings is inconstant in size; the spot before the upper median nervule is liable to obliteration on the upper surface; below, the forewings have in one of my specimens two faint white submarginal spots, one before, the other behind the second discoidal nervule. The white discal patches of the hindwings are not quite constant in size.

Hab. Guadalcanar Island, Solomon Islands (7 ♂, 4 ♀).

94. *Papilio prospero* Grose Smith [♂, ♀].

♂ ♀. *Papilio prospero* Grose Smith, *Ent. Mo. Mag.* XXV, p. 302 (1889) (Rubiana Lagoon): id. & Kirby, *Rhop. Erot.* I, *Pap.* p. 19, t. 9, f. 1 (♂), 2 (♀) (1890).

♂. Differs from *P. hecataeus* Godm. & Salv. in the spot before and that behind the upper median nervule of the forewings being absent, in the broader white band of the hindwings, and in the three anterior spots of the submarginal row of the hindwings below being obliterated.

The spot before the lower median nervule of the forewings is mostly indicated, seldom entirely absent; the band of the hindwings enters apparently always the apex of the cell; in one specimen in my collection the three anterior submarginal spots on the underside of the hindwings are present, but extremely small.

As the third and fourth spots (counted from behind) of the macular band of the forewings are in some individuals of *P. hecataeus* very much reduced; as further the band of the hindwings of *P. hecataeus* is inconstant in breadth; and as the three anterior submarginal spots of the hindwings beneath are sometimes indicated, it is not improbable that in future intermediate specimens between the *males* of *P. hecataeus* and *prospero* will turn up.

♀. I have before me three specimens from Rubiana (New Georgia), one collected by Mr. Woodford and two obtained by Capts. Webster and Cotton. These individuals differ from Mr. Grose Smith's type-specimen in the cellular patch of the forewings being much larger, even larger than in *P. hecataeus*; in the discal patches of both wings being as large as in this latter species, not smaller; and in the marginal spots of the hindwings being of much inferior size than in the type of *prospero*. In Woodford's example the submarginal spots of the hindwings are smaller than in my other specimens and in the type. The marginal spots of the forewings of *P. prospero*-♀ (type) are merged together with the submarginal spots, exclusive of the two spots before and behind the fifth subcostal nervule, which stand separate; the two specimens collected by Capt. Webster exhibit the same character, but the markings are smaller and the two anterior submarginal spots are wanting. In Woodford's specimen only two submarginal spots are developed above, and stand separate from the marginal markings before and behind the second discoidal nervule; below, these two spots are confluent with the marginal ones, and there are two others before them, standing separate, and three behind them being joined to the marginal spots.

These *females* prove the same that I remarked about the *male*, namely, that the differences between *P. hecataeus* and *prospero* are scarcely of specific value, and that *P. prospero* most probably will sink in future to the rank of a subspecies of *P. hecataeus* Godm. & Salv.

Hab. New Georgia (Rubiana), Solomon Islands (6 ♂, 3 ♀).

X. MEMNON-GROUP.

Sexes dissimilar; base of wings below with red spots.

Note.—In *P. lorei*, *mayo*, and *memnon* the red patch at the base of the forewings, above and beneath, consists of narrow scales, which are rounded at the apex or bear a sinus in the middle of the apical margin. In *P. deiphobus*, *deipylus*, *deiphontes*, and *rumanzovius* these scales are of usual breadth, with the apex 3 to 6 dentate. *P. penonius* occupies a somewhat intermediate position, but stands nearer, in that respect, to *P. memnon* than to *P. deiphobus*. From *P. uscalaphus* those red patches are always (?) absent.—K. J.

95. *Papilio memnon* L. [♂, ♀, metam.].

Seba, *Thes.* IV. p. 22. t. 16. f. 10. 11 (1765) (Batavia).

♂. *Papilio Eques Trojanus memnon* Linné, *Syst. Nat.* ed. x. p. 460. n. 12 (1758) (Asia); id., *Mus. Lud. Utr.* p. 193. n. 12 (1764) (*var. excl.*: "in Luzonum insulis" *ex. err.*); id., *Syst. Nat.* ed. xii. p. 747. n. 13 (1767) (*syn. excl.*: "China" *ex. err.*); Houtt., *Naturl. Hist.* I. 11. p. 196. n. 12 (1767); Muller, *Naturs.* V. 1. p. 569. n. 13 (1774) (*var. excl.*); Cramer, *Pap. Exot.* I. p. 142 (*p.p.*). t. 91. f. c (1776) (Batavia); Sulzer, *Gesch. Ins.* p. 141. t. 12. f. 5 (1776); Goeze, *Ent. Beytr.* III. 1. p. 35. n. 13 (1779) (*syn. ex parte*); Fabr., *Spec. Ins.* II. p. 6. n. 23 (1781) (*syn. excl.*: "China" *ex. err.*); Jablonsky, *Naturs. Schmetz.* I. p. 210. n. 10. t. 6. f. 2. 3 (1783); Fabr., *Mant. Ins.* II. p. 4. n. 25 (1787); Roemer, *Gen. Ins. Linn. et Fabr.* p. 17. t. 12. f. 5 (1789) ("China" *ex. err.*); Gmelin, *Syst. Nat.* I. 5. p. 2232. n. 13 (1790) (*ex parte*); Esper, *Aust. Schmetz.* p. 86. t. 20. f. 3 (1790); Fabr., *Ent. Syst.* III. 1. p. 12. n. 36 (1793) (*syn. excl.*: "China" *ex. err.*).

♀¹⁰. *Papilio Eques Trojanus achates* Sulzer, *Abgek. Gesch. Ins.* p. 141. t. 12. f. 2 (1776) (Asia); Cramer, *l.c.* III. p. 84. t. 243. f. A (1782) ("Coromandel" *ex. err.*); Jablonsky, *l.c.* II. p. 179. n. 41. t. 15. f. 1 (1784); Fabr., *Mant. Ins.* II. p. 3. n. 19 (1787) (*p.p.*); Roemer, *Gen. Ins. Linn. et Fabr.* p. 68. t. 12. f. 2 (1789); Gmelin, *Syst. Nat.* I. 5. p. 2229. n. 284 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. 1. p. 9. n. 24 (1793) (*p.p.*).

♂. *Papilio Eques Trajanus atrocautus* Goeze, *Ent. Beytr.* III. 1. p. 41. n. 23 (1779) (*type*: Seba, *Thes.* IV. t. 16. f. 10. 11).

♀¹⁰. *Papilio Eques Trajanus laomedon* Cramer, *Pap. Exot.* I. p. 78. t. 50. f. A. B (1776) ("Coromandel" *loc. err.*); Esper, *Aust. Schmetz.* p. 37. sub n. 13 (1786).

♀¹⁰. *Papilio Eques Trajanus memnon* var. *laomedon*, Jablonsky, *Naturs. Schmetz.* I. p. 215. sub n. 10 (1783).

♀¹⁰. *Papilio Eques Trajanus ancaeus* Cramer, *l.c.* III. p. 44. t. 222. f. A. B (1782) (W. Sumatra); Jablonsky, *Naturs. Schmetz.* II. p. 15. n. 13. t. 8. f. 1 (1784); Esper, *Aust. Schmetz.* p. 135. n. 61. t. 35. f. 1 (1788).

♀¹⁰. *Papilio Eques Trajanus achatiadis* Esper, *Aust. Schmetz.* p. 118. n. 52. t. 18. f. 2 ("♂" *ex. err.*) & t. 19. f. 1 (1786).

♀¹⁰. *Papilio agenor*, Donovan, *Ins. of China* t. 24. f. 2 (1798).

♂. *Papilio deiphobus* var., Thunberg, *Mus. Nat. Ups.* XXII. p. 8 (1804).

♀¹⁰. *Achillides achates*, Hübner, *Verz. bek. Schm.* p. 85. n. 879 (1816) (*p.p.*).

♀¹⁰. *Hiades ancaeus*, Hübner, *l.c.* p. 88. n. 927 (1816).

♀¹⁰. *Hiades laomedon*, Hübner, *l.c.* p. 89. n. 928 (1816).

♂. *Hiades memnon*, Hübner, *l.c.* p. 89. n. 930 (1816).

♂ ♀. *Papilio memnon*, Godart, *Enc. Méth.* IX. p. 29. n. 10 (1819) (*p.p.*); Horsf., *Cat. Lep. Ins. Mus. E. I. C. I.* t. 3. f. 3 (l.). 3a (p.) (1828); Swainson, *Zool. Illustr.* (2). III. t. 95 (1833) ("type of subgenus *Papilio*"; Java); Boisdu, *Spec. Gén. Léop.* I. p. 192. n. 6 (1836) (*p.p.*); De Haan, *Verh. Nat. Gesch. Ned. orerz. bez.* p. 23 (*ex p.*). t. 3. f. 2. 3 [♀¹⁰] (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 30 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 13. n. 47 (1852) (*p.p.*); id., *List Lep. Ins. B. M.* I. p. 14. n. 51 (1856) (*p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 99. n. 202 (*p.p.*). t. 2. f. 7 (l.). 7a (p.) (1857); Vollenhoy., *Tijdschr. v. Ent.* III. p. 72. n. 14 (1860) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 324. n. 459. & p. 372. n. 274 (1864) (*p.p.*); Reak., *Tr. Ent. Soc. Phil.* p. 449. n. 4 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 46. n. 43. t. 1. f. 1 (♂). 2 [♀¹⁰]. 3 [♀¹⁰]. 4 [♀¹⁰] (1865) (Java);

- Sumatra; Borneo; Lombok); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 256. n. 74 (1869) (*ecol. of vars.*); Piepers, *Tijdschr. v. Ent.* XIX. p. 157. n. 72 (1876) (Batavia); Salv. & Godm., *P. Z. S.* p. 641 (1878) (Billiton I.); Oberth., *Et. d'Ent.* IV. p. 34. n. 10. 11 (1879) (*p.p.*); Stauding. & Schatz, *Exot. Schm.* I. p. 8 (1884); Kheil, *Rhop. Nias* p. 37. n. 141 (1884) (Nias I.); Piepers, *Tijdschr. v. Ent.* XXXI. p. 350. t. 8. f. 5 (*l.*) (1888) (Java; life hist.); Hagen, *Berl. Ent. Zeit.* XXXVII. p. 155. n. 168 (1892) (Banka I.); id., *Iris* VII. p. 23. n. 21 (1894) (Sumatra).
- ♂. *Papilio arbates* Zinken, *Nov. Act. Ac. Nat. Cur.* XV. p. 151. n. 6 (1831) (Java).
- ♂. *Papilio memnon*, Aurivillius, *Konigl. Sr. Vet. Ak. Handl.* XIX. 5. p. 17. n. 12 (1882).
- ♀⁽²⁾. *Papilio achates*, Heylarts, *Tijdschr. v. Ent.* XXXIV. *Versl.* p. 28 (1891) ("♂" *ec. cer.*); Snelt., *ibid.* *Versl.* p. 115 (1891) (*contra* Heylarts).
- ♀⁽¹⁾. *Papilio esperi*, Hagen (*non* Butler, 1877), *Iris* VII. p. 23. n. 22 (1891) (Sumatra).
- ♀⁽¹⁾. *Papilio memnon* var. *javanicus* Haase, *Untersuch. üb. Mim.* p. 57 (1893).
- ♀⁽¹⁾. *Papilio memnon* var. *robinus* Haase, *l.c.* p. 57 (1893).

If we treat the various "species" erected by Messrs. Butler & Distant as synonyms or as aberrations, for reasons explained under *P. memnon agenor* L. there remain four "species" which run into one another, and are accordingly enumerated here as subspecies; to this number we have to add a fifth local form peculiar to the Loo Choo Islands.

- (a): *P. memnon* L. from Java, Nias, Sumatra, Natuna Islands, and Borneo;
 (b): *P. memnon oceani* Doherty from Engano Island;
 (c): *P. memnon merapu* Doherty from Sumba, Sambawa, Adonara;
 (d): *P. memnon agenor* L. from Malacca, Siam, Burma, Continental India (exclusive of South and West India), Tonkin, China (and South Japan?);
 (e): *P. memnon pygeri* subsp. nov. from the Loo Choo Islands.

In all these local races, exclusive of *P. memnon oceani* Doh. and *P. memnon merapu* Doh., of which only a small series of specimens is known, the *mules* vary in the forewings, being provided above with a red spot at the base of the cell, or being without that mark: on the underside the amount of red at the base of the wings is also variable; in the single known *male* of *P. memnon oceani* the red colour is almost (not wholly, as W. Doherty says) wanting. The length of the bluish grey or grey lines on the upperside of the wings is variable in specimens from the same locality.

The *females* are dimorphic in the shape of the hindwings, the latter being tailless or tailed; in colour and pattern they are polymorphic; we must, however, exclude again *oceani* and *merapu*, of which we know so little. The Loo Choo *Papilio* has only one form of the *female* sex, which, moreover, seems to be very constant; this case of monomorphism in one subspecies and polymorphism in the other recalls to mind a similar development in the local forms of *P. dytius* L., *P. polytes* L., *P. rumanzovius* Eschsch., etc. (see p. 305).

The tailed and tailless *females* of *P. memnon* L. and *P. memnon agenor* L., as well as the various colour varieties, are not confined to certain localities within the respective ranges of these subspecies; ab. *esperii* Butl. of *P. memnon agenor* alone is apparently local; in certain places, however, and at certain times of the year, the one or the other of the aberrations is more prevalent. I do not know of any breeding experiments by which it is clearly proved that one *female* produces several forms.

Though I have treated the *female* of *P. polytes* L. as tri- and tetramorphic, I think it will be best to treat the *female* of the present *Papilio* as dimorphic, notwithstanding its being still more variable than that insect; as it is impossible to draw exact parting lines between the numerous colour varieties of *P. memnon*-♀

and *agenor*-♀, it will be much more convenient to accept two ♀♀-formae, a tailless and a tailed form, each including a great number of aberrations, than to enumerate several dozens of aberrations as ♀♀-formae.

(a): *P. memnon* L., forma typ. [♂, ♀, metam.].

♂. The streaks of greyish blue scales on the upperside of the hindwings are extended inwardly as far as the apex of the cell; the cell is entirely black, or there are greyish blue scales in the apex along the veins, or the apical third is covered with greyish blue scaling; this latter character occurs chiefly in Nias specimens. The black interspaces between these streaks are somewhat dilated at their outer end, so as to form a series of submarginal black spots which correspond to the submarginal spots of the underside. Below, the grey, or bluish grey, or buffish streaks of the forewings are longest and broadest in the Nias examples, shortest and thinnest in those from Borneo. The bluish grey area of the hindwings is broadest again in the Nias individuals, where this area extends mostly far beyond the inner row of black spots, which sometimes is, however, also the case in specimens from other localities; near the anal angle there is not often a tint of ochreous.

♀. Dimorphic. Very variable in pattern.

(a¹): ♀-f. *luomedon* Cramer, l.c. Tailless. The principal aberrations, which partly have received names, are as follows:—

(a²): Typical coloration. Above, forewings with red basal patch; hindwings without white, lighter in the outer half than at the base, with a series of submarginal and another series of fainter subdiscal black spots; abdomen blackish.

(b¹): Like (a²), but forewings with a large subapical white patch.

(c²): ♀-ab. *erebinus* Haase, l.c.

P. luomedon var., De Haan, l.c. t. 3. f. 2 (1840).

Like (b²), but hindwings above colored almost as in the *male*, with a yellow mark at anal angle; posterior half of abdomen yellow.

(d²): Like (b²), but abdomen as in (c).

(e²): ♀-ab. *anceus* Cramer, l.c.

Like (a²), but patch at base of forewings white or yellowish white instead of red.

(f²): ♀-ab. *javannus* Haase, l.c.

P. achates var., De Haan, l.c. t. 3. f. 3 (1840).

Hindwings with the apex of cell, and six or seven spots round cell white; discal series of black spots absent above, as in the following aberrations.

(g²): Wallace, l.c. t. 1. f. 2 (1865). Like (f²), but cell of hindwings without white.

(h²): Hindwings white, base and a series of submarginal spots black; abdomen black.

(i²): Like (h²), but abdomen yellow, with a dorsal black median line.

(*h*²): Like (*g*²), but forewings with a large subapical white patch.

In all these aberrations the anal angle of the hindwings is mostly tinged with yellow. The basal red spots on the underside of the hindwings vary in number from two to four.

(*h*¹): ♀-f. *achates* Sulzer, *l.c.*; Wallace, *l.c.* t. 1. f. 4. Tailed. Hindwings with two-thirds of cell and six or seven large spots round the cell white; these discal spots very variable, the intermediate ones often partly or totally obliterated. Patch at the base of the forewings above red or whitish buff. Abdomen yellow, with a black dorsal line.

Hab. Java [6 ♂, 14 ♀⁽¹⁾, 5 ♀⁽²⁾]; Nias [13 ♂, 11 ♀⁽¹⁾, 1 ♀⁽²⁾]; Sumatra [3 ♂, 4 ♀⁽¹⁾]; Natuna Islands [2 ♂, 1 ♀⁽¹⁾]; Borneo [15 ♂, 6 ♀⁽¹⁾].

I have a *male* and a ♀-f. *laomedon* Cram. from Sumatra, caught in copula, and still united to one another.

(*b*): ***P. memnon oceani*** Doherty [♂, ♀].

♂ ♀. *Papilio (Ilides) oceani* Doherty, *Journ. As. Soc. Beng.* p. 31. n. 49 (1891) (Engano I.).

Mr. W. Doherty obtained one pair of this insect only; further researches must show whether *oceani* can stand as a subspecies, or whether the two type-specimens are mere individual aberrations; as *P. memnon* from Java, Nias, Sumatra, Borneo, and Buuguran are the same, it is rather striking that the island of Engano should have a local form of its own. It can certainly not stand as a species; the distinguishing characters are so variable in *P. memnon* that many *memnon* are almost identical with the *female* of *oceani*.

♂. Bluish streaks of the hindwings above, and luteous grey streaks of the forewings below, much reduced; red spots on the hindwings below obliterated, that of the forewings indicated by a number of red scales: inner series of black spots of the underside of the hindwings barely indicated, chiefly owing to the grey area not extending, as in *P. memnon*, along the nervules, so as to surround or partly surround those subdiscal spots.

♀. Tailless. Basal red patch of the forewings above small (not absent, as is said in Doherty's description); those of the hindwings below also small, but larger than in some specimens of *P. memnon*. The other characters mentioned by Doherty appear also in certain *P. memnon* ♀-f. *laomedon* Cram.

Hab. Engano Island (1 ♂, 1 ♀; *types*).

(*c*): ***Papilio memnon merapu*** Doherty [♂].

♂. *Papilio (Ilides) merapu* Doherty, *Journ. As. Soc. Beng.* p. 191. n. 108 (1891) (Sumba).

♂ ♀. *Papilio memnon*, Snellen (*avc* Linné, 1758); *Tijdschr. v. Ent.* XXXIV. p. 251. n. 50 (1891) (Flores).

Doherty described this insect from huge *male* specimens which were of the size of the largest *P. memnon aeger* L. and *P. memnon pryeri* Rothsch. subsp. nov. I have not had an opportunity to compare specimens from Sumba, but I think that the specimens from Sambawa and Adonara in my collection, though of the usual size of *P. memnon*, *i.e.* smaller than typical *merapu*, cannot be separated from *merapu*; I am the more convinced that I am right in this surmise as the other *Papilios* known from Sumba and Sambawa are identical. The Sambawa and Adonara specimens agree quite well with Doherty's description, except in size.

3. The bluish grey area of the hindwings is mostly much narrower above than in *P. memnon*; below it is also narrow, but in some specimens not narrower than in certain *P. memnon*, and more or less tinged with ochreous; in one of the two Adonara specimens in my collection the ochreous colour is very conspicuous. The white marginal internervular fringes are larger than in *memnon*.

Snellen (*l.c.*) says that the *mules* from Flores differ from *P. memnon* in the outer region of the underside of the hindwings being reddish yellow instead of grey; he does not say whether the *female* is also different.

♀. This sex has been discovered by Dr. Staudinger's collector on Sambawa; it is very peculiar in pattern; monomorphic.

Upperside: forewings brown, darker at the base, with a red patch in the base of the cell; marginal fringe white between the nervules. Hindwings of the ground-colour of the forewings or deeper brown; a discal macular band buffish white or yellowish buff, rather narrow, not touching the cell, in one specimen only slightly marked, being much shaded with brown; the band consists of seven spots; the postcostal spot is sublunate, about twice as broad (transversely) as long, absent from one individual; the anal one is tinged with orange or yellow, and is joined to the last marginal marking. Submarginal black spots longer than in *P. memnon* L., those between the median branches longer than the corresponding white discal markings. Marginal spots clearly marked in three specimens out of four before me (two belong to Dr. Staudinger).

Underside: with the basal red markings well developed. Hindwings with the discal band whiter, better defined, owing especially to the ground-colour of the wing being much darker than above; the middle spots of the band bear a small and faint blackish brown centre; though the markings are produced along the nervules, they are not joined to the marginal spots.

Hub. Sumba; Sambawa (W. Doherty, September 1891) (6 ♂, 2 ♀); Flores; Adonara (W. Doherty, November 1891) (2 ♂).

(d): ***P. memnon agenor*** L. [♂, ♀].

Houttyn, *Naturl. Hist.* I. 11, p. 196, sub n. 12, t. 87, f. 2 (♂) (1767) (China).

- ♀¹. *Papilio Eques Trojannus agenor* Linné, *Syst. Nat.* ed. x, p. 469, n. 13 (1758) (Asia); Clerck, *Icones Ins.* I. t. 15, f. 1-2 (1759); Linné, *Mus. Lud. Urb.* p. 194, n. 13 (1764) (China); id., *Syst. Nat.* ed. xii, p. 747, n. 14 (1767); Houtt., *Naturl. Hist.* I. 11, p. 197, n. 13 (1767) (*p.p.*); Muller, *Naturs.* V. I. p. 570, n. 14 (1774); Fabr., *Syst. Ent.* p. 446, n. 18 (1775) (China); Cramer, *Pap. Ec.* I. p. 52, t. 32, f. v. b (1775) (China; Coromandel; *see* Batavia); Goeze, *Ent. Beytr.* III. 1. p. 35, n. 14 (1779) (*syn. ex parte*); Fabr., *Spec. Ins.* II. p. 7, n. 25 (1781) (China; *syn. ex parte*); Jablonsky, *Naturs. Schneitt.* II. p. 20, n. 14, t. 8, f. 3 (1784); Fabr., *Mus. Ins.* II. p. 4, n. 27 (1787); Gmelin, *Syst. Nat.* I. 5, p. 2232, n. 14 (1790) (*syn. ex parte*); Esper, *Aust. Schneitt.* p. 108, n. 46, t. 26, f. 1 (1792); Fabr., *Ent. Syst.* III. I. p. 13, n. 39 (1793) (*syn. ex parte*); Thunberg, *Mus. Nat. Ups.* XXIII, p. 8 (1804).
- ♂. *Papilio Eques Trojannus memnon* var., Linné, *Mus. Lud. Urb.* p. 193, sub n. 12 (1764); Müller, *Naturs.* V. I. p. 570, t. 17, f. 2 (1774).
- ♂. *Papilio Eques Trojannus memnon*, Fabricius, *Syst. Ent.* p. 446, n. 17 (1775) (*syn. excl.*); id., *Spec. Ins.* II. p. 6, n. 23 (1781) (*ex parte*); Esper, *Aust. Schneitt.* p. 35, n. 13, t. 8, f. 1 ("♀" *ex err.*) (1785) (*ex p.*); Fabr., *Ent. Syst.* III. I. p. 12, n. 36 (1793) (*ex p.*); Thunberg, *Mus. Nat. Ups.* XXIII, p. 9 (1804).
- ♂. *Papilio Eques Trojannus androgeus* Cramer, *Pap. Ec.* I. p. 142, t. 91, f. v. b (1776) (China); Goeze, *Ent. Beytr.* III. 1. p. 43, n. 16 (1779).
- ♂. *Papilio Eques Trojannus memnon* var. *androgeus*, Jablonsky, *Naturs. Schneitt.* I. p. 213, sub n. 10 (1783).
- ♂. *Papilio Eques Trojannus memnon* var. *androgeus* (?), Gmelin, *Syst. Nat.* I. 5, p. 2232, sub n. 13 (1790).
- ♂. *Papilio Eques Trojannus proteus*, Esper, *Aust. Schneitt.* p. 120, n. 53, t. 29, f. 2 (1792).

- ♀⁽²⁾. *Papilio Eques Trojanus alcaeor* Cramer, *Pap. Es.* II. p. 107. t. 16i. f. A (1779) (China) ; Goeze, *Ent. Beytr.* III. 1. p. 44. n. 20 (1779) ; Esper, *Jusl. Schmett.* p. 134. n. 60. t. 34. f. 2 (1795?).
- ♀⁽²⁾. *Papilio Eques Trojanus achates* Cramer (*nee* Sulzer, 1776), *Pap. Es.* II. p. 130. t. 182. f. A. B (1779) (China ; "Java" *ex err.*) ; Goeze, *Ent. Beytr.* III. 1. p. 42. n. 11 (1779) ; Fabr., *Spec. Ins.* II. p. 5. n. 19 (1781) (*p.p.*) ; Jablonsky, *Naturs. Schmett.* II. p. 179. n. 41 (1784) (*p.p.*) ; Fabr., *Mant. Ins.* II. p. 3. n. 19 (1787) (*p.p.*) ; Gmelin, *Syst. Nat.* ed. xiii. I. 5. p. 2229. n. 284 (1790) (*p.p.*) ; Esper, *Jusl. Schmett.* p. 116. n. 51. t. 28. f. 1 ("♂" *ex err.*) (1792?) ; Fabr., *Ent. Syst.* III. 1. p. 9. n. 24 (1793) (*p.p.*).
- ♀⁽²⁾. *Papilio Eques Trojanus alpheor*, Fabricius (*nee* Cramer, 1779), *Spec. Ins.* II. p. 4. n. 11 (1781) ; Jablonsky, *Naturs. Schmett.* II. p. 205. n. 44. t. 16. f. I (1784).
- ♀⁽²⁾. *Achillides achates*, Hübner, *Fesz. bek. Schm.* p. 85. n. 879 (1816) (*p.p.*).
- ♀⁽²⁾. *Achillides alcaeor*, Hübner, *l.c.* p. 85. n. 880 (1816).
- ♀⁽¹⁾. *Hiades agenor*, Hübner, *l.c.* p. 89. n. 929 (1816).
- ♂. *Hiades nestor* Hübner, *l.c.* p. 89. n. 930 (1816) (*nov. nom. loco androgens* Cram.).
- ♂ ♀. *Papilio agenor*, Godart, *Eur. Méth.* IX. p. 28. n. 9 (1819) (*p.p.*) ; Oberth., *Et. d'Ent.* XVII p. 1 (1893) (Tonkin).
- ♂. *Papilio thumbergi* Siebold, *Hist. Nat. Jap.* p. 16 (1824) (Japan).
- ♂ ♀. *Papilio memnon*, Boisduval, *Spec. Gén. Léop.* I. p. 192. n. 6 (1836) (*p.p.*) ; De Haan, *Verh. Nat. Gesch. Ned. oecuz. bez.* p. 23 (1840) (*p.p.*) ; Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 30 (1846) (*p.p.*) ; Gray, *Cat. Lep. Ins. B. M. I.* p. 13. n. 47 (1852) (*p.p.*) ; *id.*, *List Lep. Ins. B. M. I.* p. 14. n. 51 (1856) (*p.p.*) ; Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 99. n. 202 (1857) (*p.p.*) ; Vollenhov., *Tijdschr. v. Ent.* III. p. 72. n. 14 (1860) (*p.p.*) ; Feld., *Verh. z. b. Ges. Wien* p. 324. n. 459. & p. 372. n. 274 (1864) (*p.p.*) ; Reak., *Tr. Ent. Soc. Phil.* p. 449. n. 4 (1864) (*p.p.*) ; Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 256. n. 74 (1869) (*p.p.*) ; Druce, *P. Z. S.* p. 109. n. 7 (1874) (Siam) ; Elwes, *ibid.* p. 873 (1881) ; Pryer, *Rhop. Nihon.* p. 4. n. 8 (1886) (Nagasaki) ; Leech, *P. Z. S.* p. 405. n. 8 (1887) (S. Japan) ; *id.*, *Bull. of Chiun.* etc. p. 544 (1893) (China & S. Japan) ; *nee* Loo Choo Is.).
- ♀⁽²⁾. *Papilio achates*, Godart, *Eur. Méth.* IX. p. 64. n. 107 (1819) (*p.p.*) ; Moore, *P. Z. S.* p. 697 (1878) (Hainan) ; Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 68 (1887) (Hainan).
- ♂ ♀. *Papilio androgens*, Moore, *P. Z. S.* p. 757 (1865) (Bengal) ; *id.* & Wall., *ibid.* p. 356 (1866) (*Formosa*) ; Moore, *ibid.* p. 841 (1878) (Hatsiega) ; Oberth., *Et. d'Ent.* IV. p. 34. n. 11. & p. 111. n. 11 (1879) (*p.p.*) ; Robbe, *Ann. Soc. Ent. Belg.* p. 125. n. 11 (1892) (Darjeeling).
- ♂ ♀. *Papilio androgens* (?), Wallace (*nee* androgens Cramer), *Tr. Linn. Soc. Lond.* XXV. p. 47. n. 44 (1865) (Malacca ; India) ; Nicéy., *Journ. As. Soc. Beng.* p. 53 & 59 (1881) (Sikkim) ; Elwes, *Tr. Ent. Soc. Lond.* p. 428. n. 408 (1888) (Sikkim ; common in the lower valleys, up to 5000 feet) ; Nicéy., *Journ. Bombay N. H. Soc.* p. 387. n. 95 (1890) (Chin-Lushai) ; Watson, *ibid.* p. 53 (1891) (Chin-Lushai).
- ♂ ♀. *Papilio agenor*, Aurivillius, *Konigl. Sc. Vet. Ar. Handl.* XIX. 5. p. 18. n. 12a (♂), 13 [♀⁽¹⁾] (1882) ; Standing & Schatz, *Exot. Schmett.* I. p. 8 (1884) ; Dist., *Rhop. Mal.* p. 339. n. 7. t. 29. f. 1 [♀⁽¹⁾] (1885) (Mal. Pen.) ; Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 66 (1887) (Hainan).
- ♂ ♀⁽¹⁾. *Papilio asperi* Butler, *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 553. n. 17. t. 68. f. 7 (♀) (1877) (Mal. Pen.) ; Dist., *l.c.* p. 341. n. 7c. t. 28. f. 1 (♂), 6 (♀) (1885) (Mal. Pen.) ; Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 67 (1887) (Hainan).
- ♂ ♀⁽¹⁾. *Papilio nestor*, Butler (*nee* Hübner, 1816), *l.c.* p. 553. n. 18 (1877) (Malacca) ; Dist., *l.c.* p. 341. n. 7d. t. 28. f. 2 (♂), 7 (♀) (1885) (Mal. Pen.).
- ♂ ♀⁽²⁾. *Papilio achates*, Butler (*nee* Sulzer, 1776), *l.c.* p. 553. n. 19 (1877) (Malacca) ; Dist., *l.c.* p. 342. n. 7e. t. 28. f. 3 & 4 (♂), 5 (♀) (1885) (Mal. Pen. ; Siam ; India).
- ♀⁽¹⁾. *Papilio phoenice* Distant, *Rhop. Mal.* p. 340. n. 7a. t. 27b. f. 7 (♀) (1885) (Mal. Pen.).
- ♂ ♀⁽¹⁾. *Papilio cilix* Distant, *l.c.* p. 340. n. 7b. t. 29. f. 4 (♂), 5 (♀) (1885) (Mal. Pen.).
- ♂ ♀. *Papilio (Hiades) androgens*, Wood-Mason & Nicéy., *Journ. As. Soc. Beng.* p. 373. n. 173 (1886) (Cachar) ; Elwes & Nicéy., *ibid.* p. 437. n. 138 (1886).
- ♂ ♀. *Hiades achates*, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 50 (1889) (Mergui & its Archipelago).
- ♂ ♀. *Hiades agenor*, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312. n. 380 (1893) (Khasia Hills).
- ♂ ♀. *Papilio (Hiades) agenor*, Nicéville, *Gazetteer of Sikkim* p. 172. n. 475 (1894) (Sikkim ; very common from April to December, up to 5000 feet ; the tailed ♀ is the commonest form).

This insect, though so very closely allied to and often indistinguishable from *P. memnon* L., has been considered by Linné to be a distinct species, because he described *P. memnon* from the *male*, and *agenor* from the *female* ; the *male* of

agenor he treated as a mere aberration of *P. memnon*, of which he did not know the other sex. Cramer named in 1776 the *male* of *agenor* *P. E. Tr. androgeus*; Hübner, being aware that Cramer had described and figured in 1775 another (American) Papilio under the name of *P. E. Tr. androgeus*, gave the name of *Ilides nestor* to Cramer's figure (♂ of *agenor* L.). Some recent English and foreign authors curiously follow Wallace in using the name of *androgeus* (instead of *androgeos*) for our Papilio, though Linné's name of *agenor* has the priority of eighteen years.

Messrs. Butler & Distant have erected five species, besides *P. agenor* L., all found in Malay Peninsula. I cannot see any reason why Messrs. Butler & Distant are correct in mating the *male* and *female* specimens as they have done; is there any reason against the *male* of Butler's *esperii*, for example, being really that of *ciliæ* or *achates* or *phœnix*? I think there is none, as the supposed different *males* of these "species" run all into one another: it is quite impossible to separate the *males* of these species, if one has a long series of specimens, unless one picks out the typical specimens and burns the intermediate ones, or describes every third specimen as a distinct species. The *females*, like those of *P. memnon*, exhibit a much greater variation than the *males*, and one might be justified in saying that at least the tailed and tailless specimens belong to two different species. But taking into consideration, firstly, that in the allied *P. polytes* L., in *P. agamemnon* L. and others, the tails appear and disappear, and are of no specific value at all; secondly, that a tailless *male* which is indistinguishable from the *males* of *agenor* must be mated with that tailed *female*; and thirdly, that, if Messrs. Butler & Distant's species were really distinct, some dozens of species would have to be erected for *P. memnon* and *agenor*, which would be quite against the rule that the nearest allied forms of insects and other creatures do not occur together on the same spot, I feel quite certain, even without the exact proof by rearing experiments, that *P. esperii*, *achates*, *phœnix*, etc., are mere aberrations of the highly variable *P. memnon agenor* L.

The specimens of *P. memnon agenor* L. from India, Siam, Malay Peninsula, China, and South Japan cannot be separated subspecifically; we must, however, note that in South Japan (Kiu-Shiu) the *females* are always tailless and form also in colour a connecting link with *P. memnon pryeri* subsp. nov. from the Loo Choo Islands; these Japanese *P. memnon agenor* L. have been described from the *male* sex, which is indistinguishable from *agenor*, as *P. thunbergi* by Siebold (*l.c.*); it may be that the Japanese *females* at least are different enough to separate them subspecifically from *agenor*, and that therefore, notwithstanding that I treat here *P. thunbergi* Sieb. as a synonym of *P. memnon agenor* L., in future *P. thunbergi* Sieb. will have to stand as a separate subspecies, *P. memnon thunbergi* Sieb.; the series of specimens from Japan I could compare was not large enough to enable me to solve this question. The *female* which Pryer (*l.c.*) figures is certainly not a Japanese one; it is exactly identical with my *female* specimens of *P. agenor pryeri* mihi, which were collected by Mr. Pryer in the Loo Choo Islands.

Owing to the occurrence of every intergraduate between the *males* and between most of the aberrations of the *females* of *P. memnon* and *agenor*, the latter must rank as a subspecies of *P. memnon*.

♂. Differs from *P. memnon* L. in the greyish area of the underside of the hindwings being obsolete, except in the anal region, where the grey colour is tinged with, or replaced by, ochreous or red; the black spots are well defined only near the anal angle; the amount of red or ochreous on the hindwings varies very much. Most

specimens have a subdiscal series of spots on the hindwings beneath, consisting of rather dispersed blue scales, which appear sometimes also in *P. memnon*. The amount of bluish grey scales on the upperside varies considerably: specimens with only a few bluish grey scales above are—

(*l*²): ab. *depelchini* Robbe.

♂. *Papilio androgeos* var. *depelchini* Robbe, *Ann. Soc. Ent. Belg.* p. 125. n. 12 (1892) (Kurseong, Sikkim).

I have a *male* and a *female* of this aberration from Sikkim which are very peculiar in the almost total absence of bluish grey scales from the upperside of the wings and in the greenish metallic gloss of the hindwings; the hindwings of both specimens are produced into a tooth at the end of the upper median nervule, as it is mostly the case in *P. memnon pygeri* Rothschild.

Two other *males*, from Sikkim and the Khasia Hills, are very remarkable in pattern; they remind one rather strikingly of the pattern of *P. polymnestor* Cram. and *lumpuacicus* Boisdu. I propose to name these specimens—

(*m*²): ♂-ab. *primigenius* ab. nov.

Upperside: hindwings in the anal region with a series of four (Khasia Hills specimen, *type*) or two (Sikkim specimen) black spots, wholly encircled with almost white scaling; bluish grey streaks much whiter than in the usual form of the *male*.

Underside: hindwings with an anal and three submarginal complete grey rings, the anal one and a grey subdiscal lunule between the two lower median nervules tinged with red at their basal sides: in the Khasia Hills specimen there is a second grey lunule before the middle median nervule, and in each of the three anterior cellules stands, close to the white marginal fringe, a grey spot, which is partly joined to a submarginal indistinct lunule, so as to form an incomplete submarginal grey ring: the subdiscal series of blue spots is complete: in the Sikkim specimen these spots are rather well defined.

The specimens were obtained in Sikkim in May 1886 (Möller *leg.*), and in the Khasia Hills in April 1889 (Rev. Hamilton *leg.*).

In one *male* from Burma in my collection the forewings have a large red basal mark, as in the *female*, and the hindwings, besides an anal red ring, a small and indistinct submarginal spot of the same colour before the lower median vein on the *upperside*.

♀. Dimorphic in shape of the hindwings; polymorphic in pattern. Specimens of the tailless form with the disc of the hindwings white are often indistinguishable from the corresponding aberrations of *P. memnon*. The anal angle of the hindwings is tinged with red or ochreous.

(*e*¹): ♀-f. *agenor* L., *l.c.* Tailless, with the following principal colour varieties:—

(*u*²): Typical coloration. Hindwings white, exclusive of basal half and submarginal black spots. (Figures: Clerck, *Icon.* 1. t. 15; Cramer, *l.c.* t. 32).

(*o*²): White of hindwings occupying also part of cell.

(*p*²): ♀-ab. *phoenix* Distant, *l.c.*

White area reduced to five patches, the posterior ones of which are strongly tinged with red, chiefly at their outer borders.

(*q*²): ♀-ab. loc. *esperii* Butl., *l.c.* (♀, *nee* ♂).

Forewings with a large white subapical patch; hindwings almost as in the *male*. I restrict this name to the *female*, as the *male* specimens which Butler mates with this *female* are not worth a varietal name. This conspicuous aberration seems to be confined to the Malay Peninsula, and I enumerate it, therefore, as "*ab. loc.*" (*aberratio alicuius loci*).

(*r*²): ♀-ab. *bullerianus* nom. nov.

Papilio nestor Butler (*nee* Hubner, 1816), *l.c.* (♀, *nee* ♂); Dist., *l.c.* t. 28. f. 7.

Forewings with a large white patch at the hinder angle; hindwings almost as in the *male*, but with a red anal ring.

Hübner's name of *nestor* was given to the *male* as figured by Cramer. *l.c.* t. 91, and cannot at all be applied to an aberration of the *female* which Dr. A. G. Butler has quite arbitrarily mated with Cramer's figure.

(*s*²): ♀-ab. *ciliæ* Dist., *l.c.* (♀, *nee* ♂).

Differs from ♀-ab. *phoenix* Dist., especially in the hindwings having only two distinct white spots besides an anal red ring.

If Messrs. Godman & Salvin's *P. ciliæ* comes in the same genus with *P. memnon* L., Distant's name of *ciliæ* must sink.

(*t*²): ab. *depelchini* Robbe (see the corresponding form of the ♂).

Similar to the *male* of ab. *depelchini* Robbe, but paler, with a strong olive-green gloss on the hindwings, the latter with an incomplete anal red ring.

(*u*²): Like (*r*²), but hindwings with a white band along the abdominal margin.

(*v*²): Like (*u*²), but anal red mark without a black centre.

Some of these aberrations resemble certain *males* of *P. rhetenor* Westw.; this superficial resemblance has, however, nothing to do with mimicry.

(*d*³): ♀-f. *alcantor* Cram., *l.c.* Tailed, the white spots more or less strongly tinged with red.

(*w*²): Typical coloration. Spot at base of forewings above red. Hindwings with a small white spot within the apex of the cell and five small white spots round the cell.

(*x*²): ♀-ab. *distantianus* nom. nov.

P. E. Tr. achates Cramer (*nee* Sulzer, 1776), *l.c.* (1779); Butler, *l.c.* (♀, *nee* ♂), Dist., *l.c.* t. 28. f. 5 (1885).

White spots of the hindwings enlarged.

Hab. India (except North-West, Central, and South India, and Ceylon), Burma, and Siam [31 ♂, 20 ♀⁽¹⁾, 8 ♀⁽²⁾]; Malay Peninsula [7 ♂, 6 ♀⁽¹⁾, 2 ♀⁽²⁾]; Formosa [2 ♂, 1 ♀⁽¹⁾, 1 ♀⁽²⁾]; Hainan; China [5 ♂, 4 ♀⁽¹⁾, 3 ♀⁽²⁾]; South Japan [2 ♂, 1 ♀⁽¹⁾; ♀⁽²⁾ does not occur].

(c): *P. memnon pryeri* subsp. nov. [♂, ♀].

♂. *Papilio memnon* var., De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 24, t. 3, f. 1 (1849) ("Japan" *loc. err.*).

♀. *Papilio memnon*, Pryer (*ovc* Linné), *Rhop. Nihon*, t. 2, f. 1 (1886) ("Japan" *loc. err.*).

♂ ♀. *Papilio memnon*, Leech, *Butterfl. of China*, etc. p. 545 (1893) (*p.p.*; Loo Choo Is.).

In most specimens of either sex the hindwings are produced into a short tooth at the end of the upper median nervule.

♂. Large. Streaks of bluish grey scales on the upperside much reduced, chiefly on the hindwings, where a rather broad marginal area is without such scales. The exterior black spots on the underside of the hindwings in the anal region are larger than in *P. memnon* L. and *agenor* L.; the transverse red bars, bordering them inwardly between the median nervules, stand farther from the margin than in those local races.

♀. Monomorphic; large, tailless.

Upperside: forewings white; apex, outer and costal margins narrowly black; patch at base, veins, and internervular folds also black; red mark at base large. Hindwings black, greenish glossy, bluish at the costal margin, with six cone-shaped white discal marks; cell without white; submarginal black spots large, that between the lower median nervules more than twice as long as broad, and, like the more rounded anal spot, partly or entirely encircled with reddish ochreous.

Underside: forewings as above, but rather more white. Hindwings with the discal white markings smaller than above. Behind the costal margin stands a seventh spot, which is mostly lunate, often ochreous red, and appears also sometimes on the upperside. Ochreous colour at anal angle yellower than above.

Abdomen entirely black.

Hab. Loo Choo Islands (15 ♂, 6 ♀).

96. *Papilio lowi* Druce [♂, ♀].

♂. *Papilio lowii* Druce, *P. Z. S.* p. 358, n. 28, t. 33, f. 6 (♂) (1873) ("Borneo" *loc. err.*).

♂ ♀. *Papilio lowii*, Standinger, *Isis* 1, p. 278 (1888) (Palawan); *id.*, *loc. II.* p. 12 (1889) (Palawan).

♂ ♀. *Papilio (Iliaides) lowii*, Semper, *Philipp., Tagfall.* p. 208, n. 407 (1892) (Palawan, September to December).

♂. Resembles *P. memnon* L., but is tailed. The grey area on the underside of the hindwings assumes sometimes the same peculiar ochraceous colour which we find in *P. memnon merapu* Doh. from the lesser Sunda Islands.

♀. Monomorphic in shape of the hindwings, being always tailed; dimorphic in colour.

(*a*²): Typical coloration. Hindwings with a large discal white patch consisting of a large cellular and seven large extracellular spots; with one series of black spots.

(*b*²): Hindwings without white, with two series of black spots.

Hab. Palawan (8 ♂, 3 ♀); Balabac (1 ♂, 2 ♀; A. Everett *leg.*).

Druce described this species from Borneo, from Mr. Low's collection: this locality is most probably erroneous. The material collected by Mr. Low in many of the Eastern islands (see Druce, *loc.*) had been in the hands of several collectors before it came (for the most part) to Mr. Druce; so it is quite probable that the localities have partly been mixed up. Certain insects mentioned in Mr. Druce's paper bear the locality "Palawan."

97. *Papilio mayo* Atkins. [♂, ♀].

- ♂. *Papilio mayo* Atkinson, *P. Z. S.* p. 736. t. 63. f. 1 (1873) (Andaman Is.); Moore, *P. Z. S.* p. 592 (1877) (Andaman Is.): Oberth., *Et. d'Ent.* IV. p. 34. n. 9 (1879) (Pt. Blair): Wood-Mas. & Nicéev., *Journ. As. Soc. Beng.* p. 237. n. 67 (1880) (Andaman Is.) ("representative of *P. polymnestor*"?).
- ♀. *Papilio charicles* Hewitson, *Ann. Mag. N. H.* (4). XIV. p. 356 (1874) (Andaman Is.); id. *Ex. Butt. V. Pap.* t. 14. f. 45 (1875); Moore, *P. Z. S.* p. 592 (1877) (Andaman Is.): Wood-Mas. & Nicéev., *l.c.* p. 237. n. 66 (1880) (Andaman Is.): "representative of *P. androgenus*!"
- ♂ ♀. *Papilio mayo*, Wood-Mason & Nicéev., *l.c.* p. 252. n. 95 (1881) (Andaman Is.); Standing & Schatz, *Exot. Schmett.* I. p. 8 (1884); Haase, *Untersuch. üb. Mim.* p. 55. t. 6. f. 38 (♀). 39 (♂) (1893).

♂. With a beautiful bluish white band across the hindwings; the latter have on the underside a complete series of discal lunules, which are partly red and partly pale blue, or all whitish blue; the number of the submarginal red markings is as variable as in *P. memnon* L. The buffish grey or grey streaks of the forewings are short and do not touch the outer margin of the wing on either side. The hindwings have a short tooth, as in *P. memnon pryveri* mihi.

♀. Monomorphic. Resembles *P. memnon agenor* ♀-f. *alcanor* Cram., but the tails have a buffish red tip, as those of *P. rhodifer* Butl., which it is said to mimic.

Hab. Andaman Islands (18 ♂, 3 ♀).

Does not apparently occur on the Nicobar Islands, where *P. doubleclayi sambilanga* Dob. instead of *P. rhodifer* Butl. flies.

98. *Papilio rumanzovius* Eschsch. [♂, ♀, larva, pupa].

Petiver, *Gazoph. Nat.* t. 11. f. 8 (1702); Ray (Rajus: Wray), *Hist. Insect.* p. 135 (1710).

♂. *Papilio Eques Trojanius panthous* Linné, *Mus. Lud. Ulr.* p. 195. n. 14 (1764) (*sub syn.*: fig. Petiv.).

♂. *Papilio Eques Trojanius deiphobus*, Houttuyn, *Naturl. Hist.* I. 11. p. 192. n. 6 (1767) (*sub syn.*): Muller, *Naturs.* V. 1. p. 568. n. 7 (1776) (*p.p.*: Philippines).

♀⁽¹⁾. *Papilio Eques Trojanius lysander* Fabricius, *Ent. Syst.* III. 1. p. 9. n. 25 (1793) (*p.p.*: "Magnitudo," etc.).

♀⁽¹⁾. *Papilio rumanzovius* Eschscholtz, *Kotzeb's Reise* III. p. 204. n. 4. t. 2. f. 4a. 4b (1821) (Manila): Thon, *Naturg. Schmett.* p. 17. t. 5. f. 6. 7 (1837) (Manila); Gray, *List Lep. Ins. B. M.* I. p. 17. n. 53 (1856).

♂. *Papilio krusensternia* Eschscholtz, *l.c.* p. 205. n. 5. t. 3. f. 5a. 5b (1821) (Manila).

♂. *Hades emalthion* Hübn., *Samml. Ex. Schu.* II. t. 117 (*post* 1822).

♂ ♀. *Papilio floridor* Godart, *Enc. Méth.* IX. Suppl. p. 809. n. 10-11 (1823) (Philippines).

♂ ♀⁽²⁾. *Papilio emalthion*, Boisduval, *Spec. Gén. Léop.* I. p. 193. n. 7 (1836) (Manila): Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 31 (1846) (Manila); Gray, *Cat. Lep. Ins. B. M.* I. p. 14. n. 48. t. 5. f. 4 [♀⁽²⁾] (1852) (Manila); id., *List Lep. Ins. B. M.* I. p. 16. n. 52 (1856); Reak., *Pr. Ent. Soc. Phil.* p. 447. n. 3 (1864); Oberth., *Et. d'Ent.* IV. p. 38. n. 20 (1879) (Manila).

♀⁽¹⁾. *Papilio descombi* Roger, *Bull. Soc. Linn. Bourbonn.* I. (1826).

♀⁽¹⁾. *Papilio descombi* Boisduval, *Spec. Gén. Léop.* I. p. 197. n. 8 (1836) (Manila); Doubl. Westw. & Hew., *l.c.* p. 10. n. 32 (1846); Gray, *Cat.*, etc. p. 14. n. 49 (1852).

♂. *Papilio emalthion*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 24 (1840) (*krusensternia* Eschsch. = *emalthion* Hübn.).

♀⁽¹⁾. *Papilio memnon* var. *rumanzovia*, De Haan, *l.c.* p. 24 (1840).

♂ ♀. *Papilio emalthion*, Felder, *Verh. z. b. Ges. Wien* p. 324. n. 456 (1864) (Luzon: "*rumanzovia* ♀ forma altera est"); Wall., *Proc. Linn. Soc. Lond.* XXV. p. 48. n. 47 (1865) (♀ dimorphic); Hopff., *Stutt. Ent. Zeit.* p. 21. n. 19 (1874) (Siao Is.).

♀. *Papilio emalthion*, Butler, *Ann. Mag. N. H.* (5). XI. p. 123. n. 82 (1883) (Mindanao).

♂ ♀⁽¹⁾. *Papilio krusensternia*, Oberthür, *Et. d'Ent.* IV. p. 38. n. 19 (1879) (Sangir Is.; Manila).

♂ ♀. *Papilio (Hades) rumanzovia*, Semper, *Philipp., Taqfal.* p. 279. n. 406. t. u. f. 9 (*l.p.*) (1892) (Philippines; Siao & Sulu Is.).

♂ ♀. *Papilio (Hades) deiphontis*, Semper, *l.c.* p. 280. sub n. 406 (1892) (Sangir Is.).

♀⁽¹⁾. *Papilio emalthion* var. *semperianus* Haase, *Unters. üb. Mim.* p. 55 (1893).

The figure of *Petiver* (*l.c.*) Linné erroneously referred to *P. mennon*. Fabricius described as *P. lysander* an American insect (*P. harrisianus* Swains. or an allied form), and in his *Ent. Syst.* (1793) he adds to the original diagnosis the description of an insect which must be the present *Papilio*. As the names of *mennon* L. and *lysander* Fabr. must be applied to those other insects, the Philippine *Papilio* has to stand as *P. rumanzovius* Eschsch., which has the priority of date over Hübner's name of *emalthion*, that most authors have incorrectly adopted.

Both sexes are tailless, as in *P. deiphontes* Feld., with which it has been confounded by Semper (*l.c.* p. 280). Semper says that this species, which he records from the Philippine, Sulu, and Siao Islands, is represented on the Sangir Islands by *P. deiphontes* Feld., which according to Semper differs in the *female* sex from *P. rumanzovius* by the absence of the red basal patch from the upperside of the forewings. W. Doherty, however, procured a good series of both sexes on Sangir and Talant (north of Celebes) which undoubtedly belong to *P. rumanzovius*; the *females* have a red basal spot above on the forewings, though this spot is indicated only by some red scales in one specimen, and is never so large as in *P. rumanzovius*. This basal mark is, however, of no specific value at all; my specimens of *P. deiphontes*, ♂ and ♀, have all a trace of this spot; it is in every specimen represented at least by some red scales, which are mostly covered by black ones; in the Sangir specimens of *P. rumanzovius* this spot is sometimes absent, sometimes present; in the Philippine specimens it is apparently always present. The chief distinguishing characters of *P. rumanzovius* are as follows:—

Forewings conspicuously narrower and longer, more sickle-shaped than in *P. deiphontes*; hindwings also longer.

Hindwings of the *male* with the bluish grey outer region broader than in any of the allied species, forming a broad band which interiorly is convex from between the upper discoidal nervule to the anal angle; anal angle with an incomplete scarlet ring.

Hindwings of the *female* above with two or more marginal scarlet spots, besides the more or less ring-shaped anal mark; these spots do not touch the margin, except the two posterior ones situated between the median nervules; below, all these spots are truly marginal, but they are not so broad at the margin itself as in *P. deiphontes*. In the latter species the hindwings have a complete series of truly marginal spots.

♂. None of my specimens have any red scales at the base of the forewings above; the anal red, incomplete, ring of the hindwings above is mostly represented by two lunate spots. Below, the amount of scarlet at the base of the wings and the size of the scarlet spots in the marginal region of the hindwings are very variable; mostly there is a discal spot between the lower median nervules, which is often connected with the corresponding marginal spot by means of a thin line along the nervules; sometimes the anal red mark or the discal spot is extended towards the base, so as to join the basal scarlet patches, as in certain *females*.

♀. Dimorphic in colour.

(a³): ♀-f. *rumanzovius* Eschsch., *l.c.*; fig.: Eschscholtz, *l.c.*

Hindwings with a white discal patch which is very variable. Below, the hindwings exhibit, as in most specimens of *P. deiphontes*, *deipylus*, and *deiphobus*, anteriorly some discal spots which are partly joined to the marginal spots. One of my Sangir specimens has a complete series of marginal spots to the hindwings above.

(b¹): ♀-f. loc. *semperinus* Haase: fig.: Gray, *Cat. Lep. Ins.* I. t. 5. f. 2 (1852).

Papilio emalithion var. *semperinus* Haase, *lc.*

Restricted to the Philippine Islands. *Upperside* black. Hindwings with a scarlet band parallel to the abdominal margin and continuous with the basal scarlet patch of the forewings; this band is often partly whitish. Below, *semperinus* resembles the *male*.

Hab. Philippine Islands [9 ♂, 4 ♀⁰, 4 ♀¹]; Sulu Islands; Sangir Islands (W. Doherty *leg.*) [22 ♂, 5 ♀⁰]; Talant Island (W. Doherty *leg.*) [1 ♂, 2 ♀⁰]; Siao Islands.

The Sangir and Talant specimens cannot be separated subspecifically from those from the Philippines; the red mark at the base of the forewing of the *female* is, however, apparently on an average larger in the Philippine examples than in those from Sangir and Talant. Specimens from the Siao Islands I have not seen.

Mr. W. Doherty did not find the ♀-f. *semperinus* on Sangir and Talant; this is very interesting, as the butterfly which is said to be mimicked by this form of the *female*, namely *P. semperi* Feld., is also absent from those islands.

99. *Papilio deiphobus* L. [♂, ♀].

Seba, *Thes.* IV. p. 57. t. 46. f. 15. 16 (♀). & p. 57. t. 47. f. 5. 6 (♂) (1765).

♂. *Papilio Eques Trajanus deiphobus* Linné, *Syst. Nat.* ed. x. p. 459. n. 6 (1758) (Asia; *excl. synonym.*); id., *Mus. Lud. Urb.* p. 188. n. 7 (1764) (Ind. orient.; *excl. synonym.*); Clerck, *Icon.* II. t. 25. f. 1 (1764); Houtt., *Naturl. Hist.* I. 11. p. 192. n. 6 (1767) (*p.p.*); Linné, *Syst. Nat.* ed. xii. p. 746. n. 7 (1767); Muller, *Naturs.* V. 1. p. 568. n. 7 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 444. n. 8 (1775) (*synon. ex parte*); Cramer, *Pap. Ex.* II. p. 129. t. 181. f. a. b (1779) (Amboina); Goeze, *Ent. Beitr.* III. 1. p. 32. n. 7 (1779) (*synon. ex p.*); Fabr., *Spec. Ins.* II. p. 3. n. 10 (1781) (*synon. ex p.*); Esper, *Aust. Schneitt.* p. 23. n. 7. t. 4. f. 1 (1784); Jablonsky, *Naturs. Schneitt.* II. p. 260. n. 50. t. 18. f. 2. 3 (1784) (*synon. ex p.*); Fabr., *Mant. Ins.* II. p. 2. n. 11 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2227. n. 7 (1790) (*synon. ex p.*); Fabr., *Ent. Syst.* III. 1. p. 5. n. 14 (1793) (*synon. ex p.*); Thunberg, *Mus. Nat. Ups.* XXI. p. 8 (1804).

♀. *Papilio Eques Trajanus alcandor* Cramer, *Pap. Ex.* I. p. 64. t. 40. f. a. b (1776) (Amboina); Goeze, *Ent. Beitr.* III. 1. p. 42. n. 13 (1779); Esper, *Aust. Schneitt.* p. 24. sub n. 7 (1784); Jablonsky, *Naturs. Schneitt.* II. p. 215. n. 45. t. 16. f. 2 (1784) (*synon. ex p.*).

♂. *Papilio deiphobus*, Donovan, *Ins. of India* t. 17. f. 2 (1800).

♂. *Achillides deiphobus*, Hübner, *Verz. bek. Schm.* p. 85. n. 877 (1816).

♀. *Achillides alcandor*, Hübner, *lc.* p. 85. n. 878 (1816).

♂ ♀. *Papilio deiphobus*, Godart, *Enc. Méth.* IX. p. 64. n. 106 (1819); Lucas, *Lép. Ex.* p. 20. t. 11 (1835) (Moluccas); Boisdu, *Spec. Gén. Lép.* I. p. 200. n. 13 (1836) (Moluccas; *inc. Celebes*); Donbl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 39 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 15. n. 58 (1852); id., *Last Lep. Ins. B. M. I.* p. 18. n. 62 (1856) (*inc. Celebes*); Vollenh., *Tijdschr. v. Ent.* III. p. 75. n. 19 (1860); Feld., *Verh. z. b. Ges. Wien* p. 323. n. 453 (1864) (Amboina; Ceram; Burn); id., *Reise Novara, Lep. I.* p. 128. sub n. 94 (1865); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 48. n. 49 (1865) (Ceram; Amboina; Burn); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 256. n. 72 (1869) (Burn); Oberth., *Et. d'Ent.* IV. p. 38. n. 17 (1879) (Amboina; Ceram); id., *Ann. Mus. Civ. Genova* XV. p. 469. n. 4 (1880) (Amboina); Auriv., *Konigl. Sr. Vet. Ak. Handl.* XIX. 5. p. 13. n. 7 (1882); Pagenst., *Jahrb. Nat. Ver. Nass.* p. 202 (1884) (*p.p.*; Amboina, apparently common); Ribbe, *Iris* II. p. 209. n. 8 (1890) (Ceram; Amboina); Röber, *Tijdschr. v. Ent.* XXXIV. p. 275 (1891) (Key Is!).

Both sexes tailed.

♂. Luteous grey streaks of the forewings, and whitish blue ones of the hindwings, sometimes partly obsolete; they remain farther from the outer margin of the wing than in *P. deiphontes* Feld. and *P. deipyllus* Feld. None of my specimens, nor

of those which have been examined in other collections, have red scales at the base of the forewings above.

♀. The amount of luteous white or white on both wings is variable; sometimes more than the apical third of the cell of the hindwings is occupied by white or buffish white; in other specimens this cellular spot is reduced to a rather small and ill-defined patch situated in the posterior part of the apex of the cell. Forewings above with a more or less distinct patch at the base, which varies in colour from red to yellow, as also the basal, marginal, and submarginal spots of the underside do in both sexes.

The submarginal and marginal spots of the hindwings beneath form hooks (anteriorly) or rings (posteriorly) in ♂ and ♀; they are, however, not constant; in the ♀ the rings are seldom complete, the submarginal spots, which here stand very far from the outer margin, being absent or merged together with the discal buffish area; in the ♂, the red discal mark close to the anal mark is often absent.

The specimens (of ♂ and ♀) with the spots yellow instead of red belong to—

(a²): ab. *hypoxanthus* Röber.

Papilio deiphobus ab. *hypoxanthus* Röber, *Tijdschr. v. Ent.* XXXIV. p. 275 (1891) (Key).

This aberration, which has been noted already by several of the old authors, occurs in all localities together with the typically coloured specimens, and is connected with them by all intergradations.

Hab. Amboina (6 ♂, 3 ♀); Ceram (2 ♂, 1 ♀); Buru (1 ♀); Key (according to Röber).

I have seen, and possess myself, specimens which are said to be from Ternate and Batjan, and Dr. Standinger speaks also of tailed *deiphontes* (Standinger & Schatz, *l.c.* p. 8) which he received from Batjan. I strongly doubt that this tailed *Papilio* occurs in the Northern Moluccas; the Moluccan insects have so often been mixed up by collectors that I do not rely upon the locality of any of the specimens collected in former times; even the Moluccan and New Guinean specimens have often been intermixed; and unless a careful collector sends tailed *deiphobus* from Batjan and Ternate, I cannot accept these localities as being inhabited, besides the tailless *deiphontes* Feld., by the tailed *deiphobus*.

100. *Papilio deipylus* Feld. [♂, ♀?].

♂ ♀. *Papilio deipylus* Felder, *Verh. z. b. Ges. Wien* p. 323. n. 455 (1864) (Nova Guinea); id *Reise Novara, Lep.* I. p. 128. n. 95 (1865) (Nova Guinea).

(!) *Papilio deiphontes* var., Standinger & Schatz, *Errol. Schwart.* I. p. 8 (1884) (Batjan; *deiphontes* with tails).

Felder gives Nova Guinea as patria of this *Papilio*; the three specimens in his collection, including the types of ♂ and ♀, bear, however, the locality "Ternate."

Staud. & Schatz, *l.c.*, record a ♂ and ♀ of a tailed *P. deiphontes* from Batjan (see above) which differ in pattern from *P. deiphontes*. Unfortunately these specimens are no longer in Dr. Standinger's collection; it is quite possible that they were *P. deipylus*, with a wrong locality attached to them. Most recently Dr. Standinger received *P. deipylus* from Waigen, and the specimen which he sent us agrees perfectly with Felder's type. The only locality from where *P. deipylus* is known at present is the island of Waigen. It is, however, quite probable that the Felderian locality "Nova Guinea" is also correct, as the Waigen *Papilios* and those from New Guinea (at least from the North-Western Peninsula) are the same.

Notwithstanding its being tailed as *P. deiphobus* L., *P. deipylus* Feld. is evidently more closely allied to *P. deiphontes* Feld. than to the other species, at least in the *male*. Of the *female* only one specimen (the type) is known, and this type-specimen comes so close to the *female* of *P. deiphobus* L. that I have some doubt if it is the proper *female* of *P. deipylus*. Staudinger's collector did not succeed in procuring this sex in Waigen.

♂. *Upperside*: almost exactly the same as in *P. deiphontes* Feld.

Underside: hindwings, with the submarginal spots standing closer to the margin, especially that behind the costa, than in *deiphontes* Feld.

♀. Felder's type differs from the *female* of *P. deiphobus* L. in the darker forewings and in the very small white cellular spot of the hindwings. All the other characters which Felder mentions in his long description apply to both *P. deipylus* Feld. and *P. deiphobus* L.

Hab. New Guinea (2 ♂, 1 ♀: erroneously labelled "Ternate" in coll. Felder); Waigen (1 ♂).

101. *Papilio deiphontes* Feld. [♂, ♀].

♀. *Papilio deiphobus* var., Boisj., *Spec. Gén. Léop.* 1. p. 201. sub n. 13 (1836) (Ternate).

♂ ♀. *Papilio deiphontes* Felder, *Verh. z. b. Ges. Wien* p. 323. n. 454 (1864) (Ternate: Halmahera; Batjan; *nom. nud.*); id., *Reise Norara, Lep.* 1. p. 126. n. 94 (1865) (Ternate); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 48. n. 48 (1865) (Batjan: Gilolo; Ternate: Morty); Oberth., *Et. d'Ent.* IV. p. 38. n. 18 (1879) (Ternate; Dodinga); id., *Ann. Mus. Civ. Genova* XV. p. 469. n. 5 (1880) (Ternate: spots of hindwings red, orange, or yellow); Butl., *Ann. Mag. N. H.* (5), XIII. p. 197. n. 43 (1884) (Ternate); Stauding. & Schatz, *Exot. Schmett.* 1. p. 8. t. 5 (♂, ♀) (1884); Grose Smith, *Nor. Zool.* p. 333. n. 5 (1894) (Ternate).

♂ ♀. *Papilio deiphobus* var. *deiphontes*, Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 203 (1884); Ribbe, *Iris* II. p. 209. sub n. 8 (1890) (Batjan).

Hindwings with a short tooth instead of a tail in either sex. Marginal internervular fringe of the wings, especially of the anterior ones, more extended white than in *P. deiphobus* L.

♂. The grey streaks of the forewings above and beneath stand closer to the margin than in *P. deiphobus*; the hindwings have above a whitish blue band composed of internervular streaks which are much broader than in that species. Some Batjan *males* in my collection have a feeble basal red patch on the forewings above. Beneath, the spots in the marginal region of the hindwings are as variable as in *P. deiphobus* L.

♀. *Upperside*: forewings, with the basal red patch sometimes exceedingly feeble. On the hindwings there is near the anterior angle a patch of blue scales, which is more conspicuous and constant than in *P. deiphobus* L.; the marginal spots are rather large.

(a²): ab. *flavus* Oberth.

Papilio deiphontes ab. *flavus* Oberth., *Et. d'Ent.* IV. p. 38. n. 18 (1879) (Ternate).

Spots yellow instead of red.

This aberration flies everywhere together with the typical form.

Hab. Ternate (15 ♂, 7 ♀) (W. Doherty, May 1892); Batjan (1 ♂, 1 ♀) (W. Doherty, May 1892); Halmahera (5 ♂, 3 ♀) (W. Doherty, August 1892); Morty; Buru (2 ♂; W. Doherty *leg.*).

I must draw the special attention of the reader to the fact that W. Doherty procured on Buru both *P. deiphobus* L. (1 ♀) and *P. deiphontes* Felder (2 ♂) during

his short stay on that island; these *males* of *deiphontes* Feld. do not differ from those from the Northern Moluccas in any way. The Buru *female* of *deiphobus* L., however, has the tails much narrower than all my other specimens; their greatest breadth does not exceed $3\frac{1}{2}$ mm., while the tails have normally a breadth of at least 5 mm., even in my smallest example, which has the forewing of a length of only 65 mm. The same Buru *female* has also rather more blue on the upperside of the hindwings.

Now I come to a question which perturbs me considerably: Are *P. deiphobus* L., *deiphontes* Feld., and *deipylus* Feld. distinct species, or must we consider them to be local forms of one insect?

The occurrence of the tailed and tailless *Papilio* on Buru (provided that the locality is correct, which I strictly believe) is rather in the affirmative, namely, that we have here constantly different species; but it is no proof, as we know from many *Papilios*, that specimens agreeing with a localised subspecies occur occasionally (sometimes regularly) among the specimens of the typical form (Staudinger's law of variation: a creature can be at the same time localised variety and not localised aberration; Eimer's law: local forms differ from the typical form in the same way as the not localised aberrations do, but exhibit the characters of the latter in a higher degree). The tailed *deipylus* and the tailless *deiphontes* are in colour almost exactly identical, and they differ only in the development of a tail; *deipylus* and *deiphobus* are both tailed, and differ only in colour. Thus it appears to me that it is impossible to unite either *P. deipylus* with *deiphobus*, which agree in being tailed, and to treat the tailless *deiphontes* as a distinct species; or *P. deipylus* with *deiphontes*, which agree in pattern, and to take *P. deiphobus* as a separate insect; but that we must treat them either as being all three distinct, or as belonging all three to one species. The latter view, which I was first inclined to adopt and which may turn out to be correct, I dare not take, in consequence of the rule which I must always follow in this paper, that I treat an insect as a subspecies only if it is connected with the typical form by intergradations. In the present case, however, the tailed and tailless forms are not connected with one another by specimens with short tails; we know at present only of specimens with a long tail, and of specimens with a short tooth to the hindwing. Both tail and tooth are in fact somewhat variable, the former chiefly in breadth, as I have said above; but no specimen I have seen has the tooth so much prolonged, or the tail so much reduced, as to form a kind of connecting link between the tailed and tailless insects.

The tailed *deipylus* and *deiphobus* differ in the *male* sex rather conspicuously in colour; true connecting links are again wanting; the *female* of *deipylus* must be left out of consideration (see under *P. deipylus*).

Though the differences between *P. deiphobus*, *deiphontes*, and *deipylus* are of no great importance, they are, to our knowledge, constantly met with, and hence I must enumerate the three insects as distinct species.

Note.—In the scaling the *males* of *P. deiphobus* L. on the one hand, and of *P. deiphontes* and *deipylus* Feld. on the other, exhibit a distinguishing character which is rather easily recognisable. The bluish grey streaks in the marginal region of the forewings above are composed in *P. deiphobus* of long and thin, almost hairlike, scales, while in the other two species these scales are much broader. This shows again that the tailed *deipylus* is less closely allied to the likewise tailed *deiphobus* than to the tailless *deiphontes*. The *females* seem to me to have no easily traceable

differences in the scaling, a fact which is almost the rule among the *females* of closely allied *Papilios*.—K. J.

102. *Papilio ascalaphus* Boisduval. [σ , ♀].

Papilio ascalaphus Boisduval, *Spec. Gén. Lép.* I. p. 200. n. 12 (σ) (1836) ("Ternate" *loc. err.*); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 26. t. 1. f. 2 (♀) (1840) (Macassar; "Ternate" *loc. err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 38 (1846) ("Ternate" *loc. err.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 15. n. 57 (1852) ("Ternate" *loc. err.*); id., *List Lep. Ins. B. M.* I. p. 18. n. 61 (1856) ("Ternate" *loc. err.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 73. n. 18 (1860) ("Ternate" *loc. err.*); Feld., *Verh. z. b. Ges. Wien* p. 323. n. 452 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 48. n. 50 (1865) (Menado; Macassar; *nec* Sulla Is.); Hopff., *St. Ent. Zeit.* p. 20. n. 18 (1874) (Celebes); Piep. & Snell., *Tijdschr. v. Ent.* XXI. p. 40. n. 160 (1878) (Macassar; Maros; very common); Oberth., *Et. d'Ent.* IV. p. 38. n. 16 (1879) (Celebes; "Ternate" *loc. err.*); Stauding. & Schatz, *Exot. Schmitt.* I. p. 8 (1884) (Celebes); Holland, *Proc. Boston N. H. Soc.* XXV. p. 77. n. 132 (1890); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

This species has two local forms:—

(a): *P. ascalaphus* Boisduval, forma typ. [σ , ♀].

σ . Very constant, except in the colour of the submarginal spots on the underside of the hindwings, which varies from orange to bluish grey.

♀ . Similar to *P. polyphontes* Boisduval and the ♀ of *P. pummon alcindor* Oberth., but larger. The submarginal spots of the hindwings above are sometimes partly obsolete.

Hab. Celebes (13 σ , 7 ♀).

(b): *P. ascalaphus ascalon* Staudinger. [σ , ♀].

Papilio ascalaphus, Wallace (*nec* Boisduval, 1836), *Tr. Linn. Soc. Lond.* XXV. p. 48. n. 50 (1865) (Sulla Is.; *nec* Celebes).

Papilio ascalaphus var. *ascalon* Staudinger, *Iris* VII. p. 348 (1895) (Mangola. Sulla Is.).

σ . Differs from *P. ascalaphus* Boisduval chiefly in the submarginal streaks on the hindwings above being very short and of a yellowish colour like those of the forewings; below, the subdiscal blue spots of the hindwings are also shorter than in *P. ascalaphus*.

♀ . One rather worn specimen is known (coll. Staudinger), which differs from that sex of *P. ascalaphus* in the forewings exhibiting a broad white band, and in the discal area of the hindwings being purer white.

Hab. Sulla Islands: Mangola Island (5 σ).

103. *Papilio oenomaus* Godart [σ , ♀].

σ . *Papilio oenomaus* Godart, *Enc. Méth.* IX. p. 72. n. 133 (1819) (Timor); Boisduval, *Spec. Gén. Lép.* I. p. 198. n. 9 (1836) (Timor).

σ ♀ . *Papilio oenomaus*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 24. t. 4. f. 1 (σ), 2 (♀) (1840) (Timor); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 33 (1846) (Timor); Gray, *Cat. Lep. Ins. B. M.* I. p. 14. n. 50 (1852); id., *List Lep. Ins. B. M.* I. p. 17. n. 54 (1856); Vollenhov., *Tijdschr. v. Ent.* III. p. 72. n. 15 (1860) (Timor); Feld., *Verh. z. b. Ges. Wien* p. 324. n. 460. & p. 372. n. 275 (1864) (Timor); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 48. n. 51 (1865) (Timor); Oberth., *Et. d'Ent.* IV. p. 38. n. 21 (1879).

There are two local forms of this insect known to me, one of which is new to science:—

(a): *P. oenomaus* Godart, forma typ. [σ , ♀].

Both sexes tailed. Forewings with a broad yellowish buff band parallel to the outer margin; hindwings in the *male* black, those of the *female* with a median yellowish buff band, which is tinged with reddish.

The submarginal red markings on the underside of the hindwings, and also the red spots at the base of the wings beneath, vary rather much in size. The black basal area of the hindwings of the ♀ extends above usually to the subcostal nervule; in one ♀, however, this area is more restricted anteriorly, the buffish band thus being broader than it normally is. The submarginal red lunules, which are present on both sides of the hindwings in the ♀, are partly feebly indicated above in some of my *males*.

Hab. Timor: Oinainisa (W. Doherty, November to December 1891) (7 ♂, 2 ♀), and Dili (W. Doherty, May 1892) (4 ♂, 3 ♀); Moa Island (1 ♂).

The *female* mimics *P. iris* Godart. The *male* from Moa Island agrees best with typical *oenomaus*; it is rather small and has the hindwings comparatively narrow; the *female* from Moa may turn out to be different from typical *oenomaus*.

(b): ***P. oenomaus subfasciatus*** subsp. nov. [♂, ♀].

♀. *Papilio oenomaus*, Rober (*nee* Godart, 1819), *Tijdschr. v. Ent.* XXXIV. p. 275 (1891) (Wetter; bad ♀).

♂. The same as *P. oenomaus* Godart; the band of the forewings above is slightly paler, and between the median nervules faintly narrower, than in most *oenomaus* Godart. The red spots at the base of the hindwings beneath are rather restricted, and the submarginal lunules are rather small.

♀. Band of the hindwings very narrow on either side and almost as red as the submarginal lunules; this band is interrupted just before the cell, and the antecellular part is in one specimen very much reduced.

Hab. Wetter (W. Doherty, May 1892) (6 ♂, 2 ♀).

A third *female* in my collection bears the locality "Timor Laut," which is probably wrong. This came from Staudinger, and was most likely wrongly labelled here at Tring.

104. ***Papilio polymnestor*** Cram. [♂, ♀, metam.].

Papilio Eques Trajanus polymnestor Cramer, *Pap. Exot.* I. p. 83. t. 53. f. A. B (1775) (Coromandel); Fabr., *Spec. Ins.* II. p. 9. n. 35 (1781); Jablonsky, *Naturs. Schmelt.* II. p. 11. n. 12. t. 7. f. 3. 4 (1784); Esper, *Ansl. Schmelt.* p. 77. n. 34. t. 19. f. 1 (1785); Fabr., *Mont. Ins.* II. p. 83. n. 51 (1787); Gmelin, *Syst. Nat.* ed. xiii. 5. 1. p. 2233. n. 296 (1790); Fabr., *Ent. Syst.* III. 1. p. 18. n. 55 (1793).

Papilio Eques Achirus polymnestor, Goeze, *Ent. Beytr.* III. 1. p. 83. n. 51 (1779).

Papilio polymnestor, Donovan, *Ins. of Ind.* t. 29. f. 2 (1800); Godart, *Enc. Mith.* IX. p. 29. n. 11 (1819); Lucas, *Lép. Exot.* p. 21. t. 12. f. 1 (1835); Boisd., *Spec. Gén. Lép.* I. p. 191. n. 5 (1836); Blanch., *Hist. Nat. Ins.* III. p. 421. n. 1 (1840); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 23 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 29 (1846) (India); Lucas, in Chenn's *Enc. d'Hist. Nat.*, *Pap.* t. 3. f. 2 (1851); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 101. n. 203. t. 3. f. 1. 1a (*l.*, *p.*) (1857) (Calcutta; *nee* Ceylon; "N. India" !); Vollenhov., *Tijdschr. v. Ent.* III. p. 72. n. 13 (1860) (Bengal); Feld, *Verh. z. b. Ges. Wien* p. 324. n. 457. & p. 372. n. 271 (1864) (Bengal; *nee* Ceylon; "Silhet, Darjeeling, Cashmere" *loc. err.*); Moore, *P. Z. S.* p. 756 (1865) (Bengal, plains); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 256. n. 73 (1869) ("Java," *loc. err. aut P. lumpsacus* Boisd.); Oberth., *Et. d'Ent.* IV. p. 34. n. 8 (1879) (Ind. centr.); Standing & Schatz, *Exot. Schmelt.* I. p. 8 (1884); Nicéev., *Journ. As. Soc. Beng.* p. 51. n. 129 (1885) (Calcutta); Elwes, *Tr. Ent. Soc. Lond.* p. 430. n. 416 (1888) (Sikkim; a single specimen, straggler from the plains); Davids. & Aitk., *Journ. Bombay N. H. Soc.* p. 366. n. 73 (1890) (reared in Kanwar); Betham, *ibid.* p. 325 (1892) (Centr. Prov.).

Hiades polymnestor, Hübner, *Verz. bek. Schm.* p. 88. n. 926 (1816); Swinh., *P. Z. S.* p. 144. n. 136 (1885) (Kurrachee).

Papilio (Hiades) polymnestor, Hampson, *Journ. As. Soc. Beng.* p. 364. n. 206 (1888) (Nilgiris, 2000 to 7000 feet); Ferguson, *Journ. Bomb. N. H. Soc.* p. 446 (1891) (Travancore).

As the Ceylon specimens of this well-known *Papilio* are, at least in the *female* sex, somewhat different from those from South and Central India, we have two local forms to enumerate:—

(a): *P. polymnestor* Cram., from the plains of Bengal, throughout the Central Provinces, to South India;

(b): *P. polymnestor parinda* (Moore), from Ceylon.

Cramer's figure, apparently representing a *male*, was taken from a Coromandel specimen, so that the mainland form must be regarded as typical *P. polymnestor* Cram.

(a): **P. polymnestor** Cram., forma typ. [σ , ♀ , metam.].

The length and breadth of the band on the forewings, and the width of the bluish white area of the hindwings, are not constant in either sex, nor is the size of the black spots to the hindwings. The *female* is somewhat paler than the *male*; the red mark at the base of the cell to the forewings above is often obliterated.

Hab. South India (11 σ , 3 ♀); Central Provinces; Bengal; Sikkim (straggler from the plains; 1 ♀).

(b): **P. polymnestor parinda** (Moore) [σ , ♀ , metam.].

Papilio polymnestor, Gray, *Cat. Lep. Ins. B. M.* 1. p. 12. n. 46 (1852) (*synon. ecel.*: Ceylon); id., *List Lep. Ins. B. M.* 1. p. 14. n. 50 (1856) (*synon. ecel.*: Ceylon); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 101. n. 203 (1857) (*p.p.*: Ceylon); Feld., *Verh. z. b. Ges. Wien* p. 324. n. 457. & p. 372. n. 271 (1864) (*p.p.*: Ceylon).

Ilides parinda Moore, *Lep. Ceyl.* 1. p. 148. t. 60. f. 1 (σ). 1a (♀). 1b (l.). 1c (p.) (1881) (Ceylon).

σ . Scarcely different from *P. polymnestor* Cram. The band on the upperside of the forewings is on an average somewhat broader behind, and also a little longer; the bluish white area is likewise slightly more extended.

♀ . Paler than *P. polymnestor* Cram.; the light parts assume a buffish colour. The band on the forewings longer and broader; the streaks between the upper median and the discoidal nervules united in pairs and touching the cell; there are buffish streaks between the third and fifth subcostal branches. The light area on the hindwings more extended basally, often reaching the origin of the subcostal nervule.

Hab. Ceylon (2 σ , 6 ♀).

105. *Papilio lampsacus* Boisdu. [σ , ♀].

Papilio lampsacus Boisduval, *Spec. Gén. Léop.* 1. p. 190. n. 4 (1836) ("Pegu" *loc. err.*); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 23. t. 2. f. 2 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* 1. p. 10. n. 28 (1846); Gray, *Cat. Lep. Ins. B. M.* 1. p. 12. n. 44 (1852); id., *List Lep. Ins. B. M.* 1. p. 14. n. 48 (1856); Vollenhov., *Tijdschr. v. Ent.* 111. p. 72. n. 11 (1860) (Java); Feld., *Verh. z. b. Ges. Wien* p. 324. n. 458. & p. 372. n. 272 (1864) (Java; "Pegu" *loc. err.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 47. n. 45 (1865) (Java); Oberth., *Et. d'Ent.* IV. p. 34. n. 7 (1879) ("Pegu" *loc. err.*; specim. typ.: Java); Staudling & Schatz, *Exot. Schmett.* 1. p. 9 (1884); Hagen, *Iris* VII. p. 25. sub n. 24 (1894).

Boisduval (*l.c.*) gave erroneously "Pegu" (Burma) as "hab." to his type-specimen. The species is apparently confined to Java; in Sumatra it is replaced by *P. forbesi* Grose Smith, and in Borneo by *P. acheron* Grose Smith. Whereas *P. polymnestor* flies chiefly at lower elevations, the three Malayan species are found in the mountainous districts, and it is not improbable that in the still unknown mountainous regions of the interior of the Malay Peninsula a fourth species lives.

Hab. Java (10 σ , 1 ♀).

106. *Papilio forbesi* Grose Smith [δ , ♀].

Papilio forbesi Grose Smith, *Ann. Mag. N. H.* (5). XI. p. 231 (δ) (1883) (Sumatra). Forbes, *Naturalist's Wand.* p. 275 (1885); Grose Smith & Kirby, *Rhop. Erot. I. Pap.* t. 1. f. 1. 2 (δ) (1887) (Bandang Agaog, Sumatra); Martin, *Naturk. Tijdschr. v. Ned. Ind.* vol. 53. pt. 3 (Sépar.) p. 4. n. 2 (1893) (descr. of ♀ ; variat. of δ); Hagen, *Iris* VII. p. 23. n. 20 (1894).

The *female* approaches, according to Martin's description (*l.c.*), rather much the preceding species; both sexes are, however, easily distinguishable from *P. lampzacus* by the red mark at the base of the hindwings beneath. The hindwings of the *male* are rather variable in pattern, and sometimes without any spots above, as in *P. acheron* Grose Smith, which Hagen (*l.c.*) calls a melanistic variety of *P. forbesi*.

Like the *females* of *P. lampzacus* Boisld. and *P. memnon* L., the *female* of *forbesi* has at the base of the forewings above often a triangular patch.

Hab. Sumatra (mountainous regions) (3 δ).

107. *Papilio acheron* Grose Smith [δ].

δ . *Papilio acheron* Grose Smith, *Ann. Mag. N. H.* (5). XX. p. 432 (1887) (N. Borneo); id. & Kirby, *Rhop. Erot. I. Pap.* t. 5. f. 1. 2 (δ) (1888); Whitehead, *Explor. Kina Balu*, p. 300 (1893); Hagen, *Iris* VII. p. 23. sub n. 20 (1894).

δ . Differs from *P. forbesi* Grose Smith especially in the buffish area of the underside of the hindwings being much restricted, and in the forewings being darker.

♀ . Unknown.

Hab. North Borneo: Mount Kina Balu (6 δ), Mount Mulu (3 δ).

If *P. acheron*, which is still scanty in collections, turns out to be as variable as *P. forbesi*, it will be difficult to draw a parting line between the two insects.

XI. PROTENOR-GROUP.

Males with a white costal mark on the upperside of the hindwings.

108. *Papilio protenor* Cram. [δ , ♀].

δ . *Papilio Eques Trajanius protenor* Cramer, *Pap. Ec.* I. p. 77. t. 49. f. A. B (1775) (China); Goetze, *Ent. Beytr.* III. J. p. 43. n. 17 (1779); Fabr., *Spec. Ins.* II. p. 7. n. 24 (1781) ("Surinam" *loc. err.*); Jablonsky & Herbst, *Naturs. Schmetz.* II. p. 5. n. 1. t. 7. f. 1. 2 (1784); Fabr., *Mant. Ins.* II. p. 4. n. 26 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2232. n. 293 (1790) ("Surinam" *loc. err.*); Esper, *Ausl. Schmetz.* p. 133. sub n. 58. t. 33. f. 2 (1792?); Fabr., *Ent. Syst.* III. 1. p. 13. n. 38 (1793) ("Surinam" *loc. err.*).

δ . *Papilio Eques Trajanius memnon* Fabricius (*nee* Linné, 1758), *Syst. Ent.* p. 446. n. 17 (1775) (*synon. evel.*; China).

♀ . *Papilio Eques Trajanius laomedon* Fabricius (*nee* Cramer, 1775), *Ent. Syst.* III. 1. p. 12. n. 35 (1793) (China).

♀ . *Papilio laomedon*, Donovan, *Ins. of China* t. 25 (1798).

Iliades protenor, Hübnér, *Verz. bek. Schm.* p. 89. n. 332 (1816).

Papilio protenor, Godart, *Enc. Méth.* IX. p. 30. n. 12 (1819); Boisld., *Spec. Gén. Lép.* I. p. 198. n. 10 (1836) (China); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 25 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 34 (1846) (N. India; China); Hutton, *Tr. Ent. Soc. Lond.* V. p. 49 (1847) (N.W. India); Gray, *Cat. Lep. Ins. B. M.* I. p. 14. n. 52 (1852); id., *List Lep. Ins. B. M.* I. p. 17. n. 56 (1856) (Kumaon; Mussoori; China); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 98. n. 201 (1857) (Bhootan); Vollenhov., *Tijdschr. v. Ent.* III. p. 72. n. 16 (1860) ("Japan" *loc. err.*); Lang, *Ent. Mo. Mag.* p. 101 (1864) (N.W. Himal., 4000 to 7000 feet); Feld., *Verh. z. b. Ges. Wien* p. 324. n. 461 (1861); Moore, *P. Z. S.* p. 487 (1865) (N.W. Himal.); id., *l.c.* p. 756 (1865) (Bengal); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 257. n. 75 (1869); Oberthl., *Et. d'Ent.* IV. p. 37. n. 13 (1879) (China; Ind. bor.); Elwes, *P. Z. S.* p. 872 (1881) (Formosa; Hong-Kong); Stauding. & Schatz, *Leot. Schmetz.* I. p. 9. t. 5

(♂) (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 428, n. 409 (1888) (Sikkim, from 2000 to 3000 feet; Khasia Hills, up to 6000 feet); Oberth., *Et. d'Ent.* XVII. p. 2 (1893) (Tonkin); Leech, *Bull. of China*, etc. p. 545 (1893) (the commonest species of *Papilio* in Central and Western China).

Sainia protenor, Moore, *P. Z. S.* p. 260 (1882) (N.W. Himal; descr. of "genus" *Sainia* Moore); Swinhoe, *Tr. Ent. Soc. Lond.* p. 312, n. 378 (1893) (Khasia Hills).

Papilio (Sainia) protenor, Doherty, *Journ. As. Soc. Beng.* p. 137, n. 232 (1886) (Kumaon, 2000 to 6000 feet).

Both sexes tailless.

The Chinese and Indian specimens are slightly different in most examples. In either sex the bluish, or bluish grey, or buffish scaling on the upper surface of the hindwings is much more extended in the Indian individuals.

The forewings vary in length from 40 to 70 mm.; the red submarginal spots of the hindwings, above and below, are inconstant in number, size, and shape: the red anal ocellus is above sometimes as indistinct as in Cramer's figure.

Hab. China (39 ♂, 10 ♀); N.W. India (1 ♂); Sikkim (4 ♂, 3 ♀); Assam (4 ♂, 1 ♀); Tonkin; Formosa.

109. *Papilio demetrius* Cram. [♂, ♀, larva].

Papilio Equus Trajanus demetrius Cramer, *Pap. Er.* IV. p. 196, t. 385, f. e. r (1782) (Japan); Jablonsky & Herbst, *Natura. Schneitt.* II. p. 223, n. 46, & p. 289, t. 20, f. 1 (1784); Esper, *Aust. Schneitt.* p. 128, n. 57, t. 32, f. 2 (1792).

Menculides demetrius, Hübner, *Verz. bek. Schm.* p. 84, n. 866 (1816).

Papilio demetrius, Godart, *Enc. Méth.* IX. p. 71, n. 128 (1819) (Japan); Boisdu, *Spec. Gén. Lép.* I. p. 199, n. 11 (1836) (Japan); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 25, t. 6, f. 1 (♂), 2 (♀) (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10, n. 37 (1846) (Japan); Gray, *Cat. Lep. Ins. B. M. I.* p. 15, n. 56 (1852); id., *List Lep. Ins. B. M. I.* p. 18, n. 60 (1856); Vollenhov., *Tijdschr. v. Ent.* III. p. 73, n. 17 (1860) (Japan); Feld., *Verh. z. b. Ges. Wien* p. 324, n. 462 (1864) (Japan); Orza, *Lép. Japon.* p. 10, n. 6 (1869) (Japan); Butl., *P. Z. S.* p. 814, n. 39 (1877) (Formosa); Oberth., *Et. d'Ent.* IV. p. 37, n. 14 (1879) (Japan); Elwes, *P. Z. S.* p. 872 (1881) (Japan; N. China: Ningpo); Pryer, *Tr. Ent. Soc. Lond.* p. 487 (1882) (Japan); Staud. & Schatz, *Exot. Schneitt.* I. p. 9 (1884); Pryer, *Rhop. Nihon.* p. 4, n. 4, t. 3, f. 1 (1886) (Nippon; from April to end of summer; larva similar to that of *maecki* Mén. & *xanthus* L.); Leech, *P. Z. S.* p. 405, n. 4 (1887) (Japan); id., *Tr. Ent. Soc. Lond.* p. 115, n. 67 (1889) (Kiu-Kiang); id., *Bull. of China*, etc. p. 546 (1893) (Japan; Eastern & Central China).

Papilio carpae *vi* Butler, *Ann. Mag. N. H.* (5). X. p. 318 (1882) (Yedo).

Both sexes tailed.

In the shape of the wings and in size this species is very variable: in three small specimens from Yokohama (April 1888), the hindwings are short and broad, and have the tails narrowed towards the tip, not spatulate; in other individuals the hindwings are elongate, and approach a little such examples of *P. macilentus* Jans. which have the hindwings shorter than usual. In the ♂ there is mostly only one red mark on the hindwings above, which stands at the anal angle; some individuals have, however, a red submarginal spot between the lower median nervules. Below, the number of the submarginal spots of the hindwings varies from four to six, those before and behind the upper median nervule being often obliterated; between the lower median veins there is mostly a reddish ochreous discal spot, which occasionally is extended along the nervules so as to join the corresponding submarginal lunule.

The *female*, which is paler than the *male* and has broader and shorter wings, has often a complete series of ochraceous red submarginal spots to both sides of the hindwings; most individuals have also a subanal mark between the lower median veins, and, below, a smaller spot between the upper median nervules.

Hab. Japan (31 ♂, 14 ♀); Loo Choo Islands (1 ♀); Formosa; Central and Eastern China.

My Loo Choo specimen has the submarginal and marginal spots of the hindwings below rather enlarged.

110. *Papilio macilentus* Janson [♂, ♀].

Papilio macilentus Janson, *Cist. Ent.* II. p. 158. t. 5. f. 1 (1877) (Oyama); Elwes, *P. Z. S.* p. 872 (1881) (Japan); Pryer, *Tr. Ent. Soc. Lond.* p. 487 (1882) (Japan); Stauding, & Schatz, *Exot. Schneitt.* p. 9 (1884); Pryer, *Rhup. Nihon.* p. 4. n. 5. t. 3. f. 2 (♀) (1886) (Yokohama, rare; more abundant in the mountains of the main island; from May during summer); Leech, *P. Z. S.* p. 405. n. 5 (1887) (Japan); id., *Tr. Ent. Soc. Lond.* p. 116. n. 72 (1889) (*P. macilentus* Jans. = *scacrola* Oberth. = *tractipennis* Butl.); Leech, *Butt. of China*, etc. p. 547 (1893) (S. & C. Japan; C. China).

Papilio scacrola Oberthür, *Et. d'Ent.* IV. p. 37. t. 6. f. 1 (1879) (China?).

Papilio tractipennis Butler, *Ann. Mag. N. H.* (5). VII. p. 139 (1881) (Nikko).

Both sexes tailed.

The white marginal fringe of the forewings is not interrupted at the veins.

The hindwings vary obviously in length; their submarginal spots are variable as in *P. demetrius* Cram. My specimens from Western China, which belong to the spring brood, are distinguished by the convex, not concave, outer margin of the forewings, which are deeper black below and above, and by the deeper red submarginal spots of the hindwings. The individuals from Kiu-Kiang stand intermediate between that Western Chinese and the Japanese forms. In all Japanese specimens the submarginal spot between the upper median nervules shows a tendency to obliteration: in the Chinese specimens this spot seems always to be developed. The marginal spots of the hindwings are in the Chinese examples on an average larger than in the Japanese ones. One of my Kiu-Kiang individuals exhibits on the hindwings above, besides the anal ocellus and six submarginal lunules, three discal spots situated between the lower median branch and the lower discoidal vein.

Further researches will perhaps prove that the Western Chinese *macilentus* represent a geographical race. Oberthür's figure of *scacrola* fits best to smaller Japanese individuals.

Hab. Japan, excl. of Yesso (8 ♂, 2 ♀); China (8 ♂).

XII. RHETENOR-GROUP.

Males tailless; without white costal patch to the hindwings above. *Females* tailed, mimetic. Body black.

111. *Papilio rhetenor* Westw. [♂, ♀].

♂. *Papilio rhetenor* Westwood, *Arc. Ent.* I. p. 59. t. 16. f. 1. 1a (♂) (1842) (Assam); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 35 (1846) (N. India: Assam); Kollar, in Hugel's *Reise Kaschmir* IV. 2. p. 403. n. 1 (1848) (Himal.); Gray, *Cat. Lep. Ins. B. M.* I. p. 15. n. 54 (1852); id., *List Lep. Ins. B. M.* I. p. 18. n. 58 (1856) (Sylhet; "female" *err. scacrola*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 98. n. 200 (1857) (Darjeeling; "female" *err. scacrola*); Feld., *Verh. z. b. Ges. Wien* p. 324. n. 463 (1864) (Sylhet; Assam; Darjeeling); Moore, *P. Z. S.* p. 756 (1865) (Bengal); Oberth., *Et. d'Ent.* IV. p. 37. n. 12 (1879) (Assam).

♀. *Papilio icarius* Westwood, *Cab. Or. Ent.* p. 5. t. 2 (1848) (Assam); Gray, *Cat. Lep. Ins. B. M.* I. p. 14. n. 51 (1852) (Assam); id., *List Lep. Ins. B. M.* I. p. 17. n. 55 (1856) (Assam); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 472 (1864); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Wood-Mason, *Ann. Mag. N. H.* (5). IX. p. 104 (1882) (*P. icarius* Westw. = ♀ of *P. rhetenor* Westw.).

- ♂ ♀. *Papilio alcmenor* Felder, *Verh. z. b. Ges. Wien* p. 324 n. 464 (1864) (*nom. nud.*) ; id., *Reise Novara*, Lep. I. p. 129. t. 20. f. d (♂) (1865) (*Ind. sept.*) ; Haase, *Untersuch. üb. Mim.* p. 54. f. 6 (♀) (1893).
- ♂ ♀. *Papilio rhotenor*, Stauding & Schatz, *Exot. Schmett.* I. p. 9 (1884) ; Elwes, *Tr. Ent. Soc. Lond.* p. 428. n. 410 (1888) (Sikkim ; not uncommon in the lower valleys and up to 5000 or 6000 feet, from April to October) ; Manders, *ibid.* p. 535. n. 190 (1890) (Shan States) ; Leech, *Batteryl. of China*, etc. p. 549 (1893) (Central and Western China) ; Haase, *Untersuch. üb. Mim.* p. 53. t. 5. f. 33 (♀). 34 (♂) (1893).
- ♂ ♀. *Papilio (Panosmiopsis) rhotenor*, Wood-Mason & Nicéy, *Journ. As. Soc. Beng.* p. 374. n. 174 (1886) (Cachar : "*Panosmiopsis*" *nom. nud.*!) ; Nicéy, *Gazetteer of Sikkim* p. 171. n. 468 (1894) (Sikkim : from April to October, up to 6000 feet ; rare).
- ♂ ♀. *Sainia rhotenor*, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312. n. 378 (1893) (Khasia Hills).

♂. *Forewings* : the outer margin is seldom convex, instead of straight or feebly concave ; the red mark at the base above is seldom entirely obliterated, a few red scales being visible under a lens in almost every individual ; as Mr. Elwes (*l.c.*) has already pointed out, many individuals have the hinder angle white.

Hindwings : above, the anal ocellus has sometimes almost disappeared ; in many examples it is large, and white instead of red, or it is reddish anteriorly, white behind ; in the lower median cellule there is often a white or reddish lunule, or a complete ring. Below, there are usually two small black spots at the anal angle within the red band along the abdominal margin ; the anterior of these spots disappears sometimes (as in the type of Felder's *P. alcmenor*) : the lower median cellule is in certain specimens filled up with red, exclusive of three rounded spots ; in other individuals these black spots are so enlarged that there remain only three small red markings ; between the middle median and the upper discoidal nervules there stand from 0 to 3 submarginal red spots, of which that between the two upper median veins is often ring-shaped.

♀. The red mark at the base of the forewings above is sometimes reduced to a narrow streak situated along the subcostal nervure ; this streak reaches in one of my Sikkim specimens half-way to the apex of the cell. The discal white patch of the hindwings consists usually of five spots, of which the posterior one, standing between the upper median nervules, is liable to obliteration ; the cellular spot is sometimes very small ; the anal, submarginal, and marginal red spots are very variable in size and shape ; there are from 2 to 4 submarginal spots. The hindwings are not constant in shape, some specimens having the tail much more prolonged than others.

The Chinese individuals of the *male* sex never exhibit the white colour at the anal angle of the forewings to such a degree as the Indian ones do ; the bluish scaling on the upper surface of the hindwings between the upper median and the subcostal nervules is much sparser, often almost absent ; the hindwings are decidedly narrower behind, more deeply scalloped, and at the end of the upper median nervule often produced into a conspicuously prominent tooth.

The Chinese *females*—of which two specimens only are known, one in Mr. Leech's collection, at present inaccessible, the other in my own collection—differ in the dentation of the hindwings being sharper, in the white discal patch being rather reduced or almost absent, and in the anterior of the two black spots at the anal angle of the hindwings being enlarged and joined to the basal black spot of the lower median cellule ; above, the hindwings have a minute red spot before the middle of that cellule, nearly as in Haase's figure of the supposed *female* of *P. alcmenor* Feld. (Haase, *l.c.*).

Felder's *P. alcmenor* is not worthy of being kept separate as an aberration.

The variety with the white hinder angles of the forewings is very remarkable, as it bears a striking resemblance to *P. memnon aeneus* ♀-ab. *butterianus* m.

Hab. China (16 ♂, 1 ♀); Sikkim (15 ♂, 5 ♀); Assam (10 ♂, 7 ♀); Cachar: Shan States (5 ♂).

XIII. ELWESI-GROUP.

Both sexes tailed. The single representative of this group will certainly come in a genus by itself in future.

112. *Papilio elwesi* Leech [♂, ♀].

Papilio elwesi Leech, *Tr. Ent. Soc. Lond.* p. 113. t. 7. f. 1 (♂) (1889) (Kin-Kiang); id., *Bull. of China*, etc. p. 550 (1893) (Kiu-Kiang; Central China: Ichang); Watson, *Ent. News* p. 279. t. 12 (♀) (1893).

This curious *Papilio* is distinguished from all the other species by the tail being traversed by the upper and middle median veins. The second discocellular veinlet of the forewings is bent inwards in a similar way as in *P. evan* Doubl. The *male* varies in the disc of the hindwings being greyish like the forewings, or more white; two of my three *males* have some feeble spots composed of bluish grey scales between the median nervules of the hindwings. The tails of the *female* are rather more rounded than in the *male*.

Hab. China: Kiu-Kiang, Ichang (1 ♂), districts west of Ichang (2 ♂).

XIV. BOOTES-GROUP.

Both sexes tailed. Body partly red or buff-colour.

113. *Papilio bootes* Westw. [♂, ♀].

Papilio bootes Westwood, *Ann. Mag. N. H.* IX. p. 36 (1842) (Sylhet); id., *Arc. Ent.* I. p. 123. t. 31 (1843) (Sylhet); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 17 (1846) (Sylhet); Gray, *Cat. Lep. Ins. B. M.* I. p. 15. n. 55 (1852); id., *List Lep. Ins. B. M.* I. p. 18. n. 59 (1856) (Sylhet); Feld., *Verh. z. b. Ges. Wien* p. 325. n. 474 (1864); Moore, *P. Z. S.* p. 672 (1867) (Sylhet).

Byasa bootes, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312. n. 383 (1893) (Khasia Hills).

Two geographical races of this *Papilio* are known to me:—

(a): *P. bootes* Westw., forma typ. [♂, ♀].

The hindwings of the *male* have above usually two white discal patches; some examples have a third, smaller spot behind the second median nervule, mostly shaded with red. Besides the anal double mark there are from one to three submarginal lunules on the upperside of the hindwings.

The *female* is paler than the *male*, larger; the hindwings have four discal spots, of which the first and fourth are the smallest.

The double spot in the dilated apical part of the tail is often much shaded with black.

Hab. Assam (8 ♂, 3 ♀).

(b): *P. bootes nigricans* subsp. nov. [♂].

Papilio bootes, Leech (*nee* Westwood, 1842), *Bull. of China*, etc. p. 551 (1893) (Western China).

This Chinese representative of *bootes* differs from the typical form as follows:

♂. Hindwings devoid of white discal spots (*type*), or with two faintly marked

spots, or with two large white patches, as in *bootes*. Tails always without spots. Front of the head ferruginous red, but with many black hairs, especially in the middle before the antennae.

♀. Unknown to me.

Hab. Western China (9 ♂).

114. **Papilio janaka** Moore [♂, ♀].

Papilio janaka Moore, *Horsf. & Moore, Cat. Lep. Ins. Mus. E. I. C. I.* p. 97. n. 198 (1857) (Darjeeling); *id.*, *P. Z. S.* p. 104. t. 45 (1857); *Feld., Verh. z. h. Ges. Wien* p. 325. n. 473 (1864); *Elwes, Tr. Ent. Soc. Lond.* p. 426. n. 402 (1888) (Sikkim; rather rare, at 3000 to 5000 feet, in May and June); *Haase, Untersuch. üb. Mim.* p. 53. t. 5. f. 36 (♀) (1893).

Papilio sikkimensis Wood-Mason, *Ann. Mag. N. H.* (5). IX. p. 103 (1882) (Sikkim).

Papilio (Panosmiopsis) janaka, Nicéville, *Gazetteer of Sikkim* p. 171. n. 469 (1894) (Sikkim; May, June, 3000 to 5000 feet, rare).

Two local forms are known:—

(a): **P. janaka** Moore, forma typ. [♂, ♀].

Mr. Wood-Mason described the basal half of the hindwings as being "green-black" in his *P. sikkimensis*, which does not exactly fit to any of my *janaka* specimens; *janaka*-males have, however, sometimes an obvious olive-green tint on the hindwings above, which may change into green-black in discoloured specimens.

P. janaka Moore differs from *P. bootes* Westw. especially in the tooth in front of the tail of the hindwings being more directed backwards, in the apical spots of the tails standing rather nearer to the apical margin of the tail, and in the red basal area of the underside of the hindwings being extended along the abdominal margin and joined, or almost so, to the red spot at the anal angle.

The ground-colour of the *female* is paler than in the *male*; the hindwings have three large white discal patches, and a smaller spot before the upper discoidal vein; the submarginal markings are large.

Though the differences between *janaka* and *bootes* are slight, they are apparently constant, at least in *janaka* from Sikkim and *bootes* from Assam. Our knowledge of the two insects is, however, very limited. As it seems to me rather improbable that each of the two has such a very restricted range, I am convinced that the two insects come together in Bhootan and probably mix with one another.

The spots at the tip of the tails are very variable in size; one of my specimens has one spot only instead of two on each tail.

Hab. Sikkim (9 ♂, 3 ♀).

(b): **P. janaka dealbatus** subsp. nov. [♂].

♂. Differs from *P. janaka* Moore in the same way as *P. bootes nigricans* m. does from *P. bootes* Westw. I have a single *male* only, which exhibits the following characters:—

A little smaller and much deeper black than *P. janaka* Moore. Hindwings, *upperside*, without discal white patches, but with a dispersed buff scaling all over the wing, exclusive of the nervules and the internervular folds; the two red spots at the anal angle separated from one another; a thin submarginal lunule between the lower median nervules; tails all black, much less spatulate than in *janaka*. Hindwings *below* with six submarginal spots, of which the first (behind the costa) is very small, the second and third a little larger, but still small and linear, the fourth slightly, the fifth and sixth strongly arched; there are two red spots

between the lower median nervules, one very small, close to the cell, the second larger, beside the anal marking.

Front of the head with many black hairs; sides of abdomen more restricted ferruginous red than in *P. jamaica*.

♀. Unknown.

Hab. Western China (west of Ichang) (1 ♂).

Mr. Leech's collectors did not meet with this insect.

XV. ILIONEUS-GROUP.

Both sexes tailed. The species of this group will probably come in one genus with *P. gembraisius* Cram. and *fuscus* Goeze.

115. *Papilio ilioneus* Don. [♂, ♀].

Papilio ilioneus Donovan, *Ins. New Holl.* t. 13 (1805) ("New South Wales" *loc. err.*); Godart, *Enc. Méth.* IX. p. 68. n. 119 (1819); Boisduval, *Spéc. Gén. Léop.* I. p. 213. n. 28 (1836); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 74 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 22. n. 95 (1852); id., *List Lep. Ins. B. M. I.* p. 29. n. 102 (1856); Olliff, *Proc. Linn. Soc. N. S. Wales* p. 412 (1887) (Norfolk I.).

Papilio amphiaranus Felder, *Verh. z. b. Ges. Wien* p. 321. n. 424. & p. 369. n. 253 (1864) (*nomen nov. loco P. ilioneus* Don.); Olliff, *Proc. Linn. Soc. N. S. Wales* p. 1014 (1887) (Norfolk I.): "no evidence that it is ever found on the mainland of Australia".

P. ilioneus Don. and *amyntor* Boisduval occur together and are certainly only aberrations of the same species. *P. abstrusus* Butler is not distinguishable from *amyntor*; Butler, when describing his species, did not compare it with *amyntor*.

Specimens which agree with Donovan's figure have the band of the forewings, the discal yellowish white patch on the hindwings, and the submarginal spots of the underside of the hindwings rather larger than they are in the following aberration:—

(a²): ab. *amyntor* Boisduval.

♂. *Papilio amyntor* Boisduval, *Bull. Soc. Ent. Fr.* p. 155. n. 3 (1859) (New Caledonia); Feld., *Verh. z. b. Ges. Wien* p. 321. n. 425 (1864); Butler, *P. Z. S.* p. 289. n. 93 (1874).

Papilio amyntor, Oberthür, *Et. d'Ent.* IV. p. 49. n. 83 (1879) (New Caled.; "♂" type-specimen).

♂. *Papilio abstrusus* Butler, *P. Z. S.* p. 618. n. 41 (1875) (Maré, Loyalty Is.); id., *Ann. Mag. N. H.* (4). XX. p. 356. n. 29 (1877) (Lifu I.).

The white patch of the hindwings above extends often beyond the second median nervule; all *male* examples have a red anal spot, the *female*, besides, one or two submarginal red spots. On the underside, the submarginal buff markings of the hindwings and the orange-red spots within them exhibit a great deal of variation in respect to the size; in some *males* most of the orange-red spots are absent.

Hab. Norfolk Island (1 ♀); New Caledonia (1 ♂, 1 ♀); Loyalty Islands: Lifu (12 ♂, 12 ♀), Maré.

Note.—The scales of the forewings above, especially towards the hind angles, are in the *male* so much elongated as to render their serial arrangement quite imperceptible; conf. *P. albinus* Wall., and also *P. helenus* L., *P. demolition* Cram., etc.—K. J.

116. *Papilio godeffroyi* Semp. [♂, ♀, metam.].

Papilio godeffroyi Semper, *Tr. Ent. Soc. Lond.* (3). II. p. 469. t. 24. f. 1 (♂). 2 (♀) (1866) (Upolu); Herr.-Schäff., *Stett. E. Zeit.* p. 78. n. 56 (1869) ("Ovalau" *loc. err.*); Butl., *P. Z. S.* p. 289. n. 90 (1874); Oberth., *Et. d'Ent.* IV. p. 114. n. 83 (1879) (Samoa); Mathew, *Tr. Ent. Soc. Lond.* p. 361. t. 10. f. 3. 4 (*l. p.*) (1885) (life hist.).

This and the following species are rather constant in the markings.

Hab. Samoa Islands (4 ♂, 3 ♀).

117. *Papilio schmeltzi* Herr.-Schäff. [♂, ♀, metam.].

Papilio schmeltzi Herrich-Schäffer, *Stett. Ent. Zeit.* p. 78. n. 57. t. 1. f. 1 (1869) (Ovalau); *id.*, *Ecot. Schm.* II. f. 106 (1869); Butl., *P. Z. S.* p. 289. n. 92 (1874); Oberth., *Et. d'Ent.* IV. p. 49. n. 84 (1879) (Fiji Is.); Butl., *Ann. Mag. N. H.* (5). XI. p. 423. n. 80 (1883); *id.*, *loc.* (5). XIII. p. 348. n. 21 (1884); Math., *Tr. Ent. Soc. Lond.* p. 357. t. 10. f. 1. 2 (*l. p.*) (1885) (life hist.).

Hab. Fiji Islands (8 ♂, 3 ♀).

118. *Papilio walkeri* Janson [♂].

Papilio walkeri Janson, *Cist. Ent.* II. p. 433. f. 8. f. 2 (♂) (1879) ("S. India").

This curious species, the type of which (now in my collection) has remained unique up to the present time, finds its place best behind *schmeltzi*; it has no near ally, and stands just as isolated as *P. diophantus* Grose Smith.

Hab. South India (1 ♂).

XVI. ANACTUS-GROUP.

119. *Papilio anactus* MacLeay [♂, ♀, metam.].

Papilio anactus MacLeay, in King's *Surv. Austr.* II. App. p. 458. n. 134 (1827) (Austr. occ.); Boisduv., *Spec. Gén. Léop.* I. p. 219. n. 37 (1836); Westw., *Proc. Ent.* II. p. 15. n. 10. t. 52. f. 3 (1845); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 9. n. 10 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 8. n. 26 (1852); *id.*, *List Lep. Ins. B. M.* I. p. 9. n. 29 (1856) (Moreton Bay); Feld., *Verh. z. b. Ges. Wien* p. 321. n. 426. & p. 369. n. 426 (1864); Semper, *Journ. Mus. Godeffroy*, Heft 14. p. 43. n. 133 (1878) (Brisbane; Rockhampton; Gayndah; Cape York); Oberth., *Et. d'Ent.* IV. p. 60. n. 151 (1879); Mathew, *Tr. Ent. Soc. Lond.* p. 176. t. 6. f. 2 (1888) (life hist.); Scott, *Austr. Lep.* II. p. 19. t. 16 (♀, *l. p.*) (1899); Haase, *Untersuch. üb. Mim.* p. 44 (1893).

There is not much variation in this species, though the markings are not constant in size; the submarginal spot on the upperside of the forewings standing between the fourth and fifth subcostal nervules is often absent.

Though *P. anactus* is in general appearance rather different from *P. aegaeus* Don., its pattern can be derived from that of the female of *aegaeus*; the larva and pupa have also some affinities to those of *aegaeus*, so that, I believe, the best place for the species in question will be near the *gambrius*-group of *Papilios*.

Hab. Queensland and New South Wales (10 ♂, 8 ♀).

XVII. EUCHENOR-GROUP.

P. euchenor Guér., *anactus* MacLeay, *ilioneus* Don., *godeffroyi* Semp., and *schmeltzi* Herr.-Schäff. will in my future generic revision most probably all come in a genus with *P. aegaeus* Don.

120. *Papilio euchenor* Guér. [♂, ♀].

Papilio euchenor Guérin, *Voy. Capuille* t. 13. f. 3 (1829) (New Guinea); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.*, p. 33 (1840) (New Guinea); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 82 (1846) (New Guinea); Gray, *Cat. Lep. Ins. B. M. I.* p. 23. n. 103 (1852) (New Guinea); id., *List Lep. Ins. B. M. I.* p. 31. n. 110 (1856) (New Guinea); Vollenhov., *Tijdschr. v. Ent.* III. p. 75. n. 33 (1860) (New Guinea); Feld., *Verh. z. b. Ges. Wien* p. 321. n. 423. & p. 368. n. 250. 251 (1864) (*p.p.*; *see* Woodlark, *see* Aru); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 58. n. 77 (1865) (*p.p.*; *see* Aru, *see* Ké); Kirsch, *Mith. Mus. Dresden* I. p. 112. n. 8 (1877) (Kordo; Dorey); Godm. & Salv., *P. Z. S.* p. 648 (1878) (New Guinea); Oberth., *Et. d'Ent.* IV. p. 51. n. 92 (1879) (*p.p.*); id., *Ann. Mus. Cr. Genova* XV. p. 473. n. 13 (1880) (Andai); Snellen, *Tijdschr. v. Ent.* XXXII. p. 395 (1889) (Ron I.); Grose Smith, *Nor. Zool.* p. 333. n. 6 (1894) (Humboldt Bay).

Papilio axion Boisduval, *Voy. Astrolabe, Entom.* p. 41. n. 6 (1832) (New Guinea); id., *Spec. Gén. Léop.* I. p. 219. n. 36 (1836) (New Guinea; *see* Arn).

This decidedly Papuan insect must be split up into four subspecies, of which that from Woodlark Island is unknown to me:—

(a): *P. euchenor* Guér. from New Guinea;

(b): *P. euchenor obsolescens* subsp. nov. from the Aru (and Key?) Islands;

(c): *P. euchenor depilis* subsp. nov. from New Britain and New Ireland; and

(d): *P. euchenor godarti* Montr. from Woodlark Island.

The markings of the *males* are primrose-yellow; those of the *females* are much paler, sometimes almost white.

(a): *P. euchenor* Guér., forma typ. [♂, ♀].

♂. *Forewings*: the median nervules traversing the primrose-yellow band are often thinly black; near the end of the cell there stand occasionally some additional small spots, especially on the underside; besides the three subapical spots there are below from one to four submarginal markings.

Hindwings below with the ochreous and the blue markings varying in size; the two marginal spots between the median nervules are sometimes tinged with ochreous.

♀. Exhibits the same variation as the *male*. In a specimen recorded by Kirsch (*l.c.*) the hindwings have above two discal spots separated from the pale creamy band.

(a²): ab. *entropius* Janson.

♂. *Papilio entropius* Janson, *Cruise of Marchesi* II. p. 376. n. 85 (1886) (Jobie I.).

The subapical spots of the forewings are large; the third one is connected with a large additional mark near the end of the cell.

This remarkable aberration, the type of which is in my collection, was found on Jobie Island.

Hab. Mainland of New Guinea (20 ♂, 10 ♀); Jobie (1 ♂-ab.); Salvatty (1 ♂); Waigeu (3 ♂, 1 ♀); Fergusson Island, D'Entrecasteaux Islands (a good series of both sexes).

Not found on the south coast of British New Guinea.

(b): *P. euchenor obsolescens* subsp. nov. [♂, ♀].

Papilio axion Boisduval, *Spec. Gén. Léop.* I. p. 219. n. 36 (1836) (*p.p.* Aru; *see* New Guinea).

Papilio euchenor, Felder, *Verh. z. b. Ges. Wien* p. 321. n. 423 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 58. n. 77 (1865) (Aru; Ké?; *see* New Guinea); Ribbe, *Iris* I. p. 78. n. 8 (1886) (Aru Is.; ♂ not rare, very quick, ♀ very rare).

♂. Scarcely different from *euchenor*; forewings always (?) with four submarginal spots below, besides the three subapical markings; the three ochreous lunules in the

anal region of the underside of the hindwings are large; the two marginal spots between the median nervules more or less ochreous; above, the abdominal margin is in the middle of the colour of the discal band; this colour is extended to the submedian nervule and is not or scarcely separated from the discal band by a black streak, as it is in *euchenor* Guér.

♀. The posterior but one spot of the discal band of the forewings, standing in *euchenor* between the submedian and the lower median veins, is obliterated; that at the inner margin is small, and that before the lower median nervule also small and above much shaded with black. On the hindwings the spots at the base of the cellules between the middle median and the lower discoidal nervules are smaller than in *euchenor*-♀; the spots between the subcostal and lower discoidal veins are deeply constricted, and in one of my specimens the exterior parts of these spots are separated from the rest as in the aberration of *euchenor*-♀ alluded to above.

Hab. Aru Islands (4 ♂, 3 ♀); Key Islands (?).

I have not seen specimens from the Key Islands.

(c): ***P. euchenor depilis*** subsp. nov. [♂, ♀].

Papilio euchenor, Godman & Salvin (*nec* Guérin, 1832), *P. Z. S.* p. 148. n. 33 (1877) (Duke of York I.); *id.*, *l.c.* p. 160. n. 45 (1879) (New Ireland).

In both sexes the forewings are shorter and rounder, and have above, besides the three subapical markings, a small submarginal spot situated between the discoidal veins. The abdominal margin of the hindwings is black, thinly bordered with primrose-yellow (♂) or creamy white (♀).

♂. The median and submedian veins of the forewings are not covered with hairs, as in *P. euchenor* Guér. and *P. euchenor obsolescens* mihi. The band of the forewings is broad, and the veins traversing it are not black in any specimen.

♀. The last but one spot of the band of the upperside of the forewings is scarcely separated from that before it, whereas in *P. euchenor* Guér. there is a rather broad black interspace between these two spots. The extracellular parts of the median band of the hindwings are large; the second and third spots are not or scarcely constricted. The ochreous markings on the underside of the hindwings are very large. Sometimes there stands, on the hindwings above, an ochraceous spot behind the costa, and another at the anal angle.

Hab. New Britain (*type*; 3 ♂, 1 ♀); New Ireland (3 ♂, 1 ♀); Duke of York Island.

(d): ***P. euchenor godarti*** Montr. [♂].

Papilio godarti Montrouzier, *Ann. Sc. Phys. Nat. Lyon* p. 398 (♂, *nec* ♀) (1856) (Woodlark I.); *id.*, *Essai Faune Woodlark* p. 120 (1857) (Woodlark I.); Butl., *P. Z. S.* p. 290. n. 94 (1874).
Papilio euchenor, Felder, *Vorb. z. b. Ges. Wien* p. 321. n. 423 (1864) (*p.p.*).

Though there is no character mentioned in Montrouzier's description in which this Woodlark *Papilio* differs from *P. euchenor* Guér. or its subspecies, it will be better to keep *godarti* separate, at least as a fourth geographical form, until we receive specimens of this insect from Woodlark Island.

Hab. Woodlark Island.

On the Solomon Islands this species has not yet been found.

Note.—The hairy streaks with which the nervules of the forewings are covered in the *males* of *P. euchenor* Guér. and *P. euchenor obsolescens* Rothsch. are of the same character as the cottony stripes known from *P. ulysse* L., *bianor* Cram., etc.

The scaling on the upperside of the forewings of *euchenor*- and *obsolescens*-males is distinguishable from that of the *males* of *P. euchenor depilis*. In the first two forms the scales of the upper layer in the anal region of the forewings are elongate, mostly bi-, seldom tridentate; in *depilis* the scales of the upper and under layers are almost of the same length, irregularly tri- or quadridentate. At the nervules the upper scales become as long in *depilis* as in *euchenor*, but they are not intermixed with hairs.—K. J.

XVIII. POLYTES-GROUP.

121. *Papilio canopus* Westw. [♂, ♀].

Papilio canopus Westwood, *Ann. Mag. N. H.* IX. p. 38 (1842) (Melville I.); id., *Acc. Ent.* II. p. 81. t. 68. f. 1. 1* (♂). 2 (♀) (1844); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 61 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 19. n. 81 (1852); id., *List Lep. Ins. B. M. I.* p. 24. n. 85 (1856) (Pt. Essington); Feld., *Verh. z. b. Ges. Wien* p. 319. n. 400 (1864); Oberth., *Ann. Mus. Civ. Genova* XV. p. 475. n. 18 (♂) (1880) (Somerset); Rothsch., *Nor. Zool.* I. p. 685 (1894).

P. canopus Westw. and *hypsicles* Hew. cannot be specifically separated; it is even difficult to separate them subspecifically, as the distinguishing characters are very inconstant. *P. vollenhovi* Feld. must also sink to the rank of a subspecies of *canopus*, as both insects are connected with one another by two intergraduate races, *hypsicles* Rothsch. and *canopus* subsp. nov. We have therefore to deal with the following subspecies of *canopus*:—

- (a): *P. canopus* Westw. from North Australia;
- (b): *P. canopus hypsicles* Hew. from New Hebrides;
- (c): *P. canopus canopus* subsp. nov. from Moa;
- (d): *P. canopus hypsicles* Rothsch. from Wetter;
- (e): *P. canopus vollenhovi* Feld. from Timor;
- (f): *P. canopus alorensis* Rothsch. from Alor;
- (g): *P. canopus umbrosus* Rothsch. from Sambawa.

The Tenimber Islands are most probably inhabited by an eighth race.

(a): *P. canopus* Westw., forma typ. [♂, ♀].

The bands on the wings are very variable in breadth. The hindwings have above a complete series of well-marked submarginal spots, or the spots are (♂, ♀) feeble.

Hab. North Australia (2 ♀).

(b): *P. canopus hypsicles* Hew. [♂, ♀].

Papilio hypsicles Hewitson, *Ex. Butterfl.* IV. *Pap.* t. 9. f. 29 (♂) (1868) (New Hebrides); Butl., *P. Z. S.* p. 289. n. 89 (1874); id., *loc.* p. 619 (1875) (Tanna, N. Hebr.); Rothsch., *Nor. Zool.* I. p. 685 (1894) ("New Caledonia" *loc. err.*?).

The wings appear less broad than in *canopus*, as the discoidal veins are shorter. Bands of the wings variable in breadth and shape; hindwings with a complete series of blue spots beyond the band; submarginal spots more yellow than in *canopus*, in ♂ sometimes obliterated, exclusive of the anal spot.

Hab. New Hebrides; [New Caledonia (2 ♂)].

My two specimens of this species, which I received from a French dealer, are labelled "Nouvelle Calédonie"; but I believe this locality is erroneous.

(c): *P. canopus canopus* subsp. nov. [♂, ♀].

Tailed; the tails thinner than in *canopus*, more spatulate than in tailed specimens of *hypsicles*. Band on forewings broad, standing closer to the margin posteriorly than in *canopus*. Band on hindwings also broad (5 to 6 mm.); like that of the forewings less incised at the nervules, which are above only partly brown, than in *canopus*; male with six, female with three faint blue spots behind the band; anal mark yellow; submarginal lunules sharply defined, below yellowish in the ♂, white in the ♀.

The bands of the female are much whiter than those of the male, and somewhat broader; that on the hindwings is especially broader in the middle where that of the male is visibly narrowed.

Hab. Moa Island (1 ♂, 1 ♀ in coll. Staudinger; 1 ♂, *type*, in coll. Rothschild)

(d): *P. canopus hypsicles* Rothsch. [♂].

Papilio vollenhovii hypsicles Rothschild, *Nor. Zool.* I. p. 685 (1894) (Wetter I.).

Usually tailed; band of the forewings narrower than in *P. vollenhovii*, except in the apical region, where it is broader than in that race; discal band of the hindwings also narrower.

Hab. Wetter Island (W. Doherty, May 1892) (5 ♂).

(e): *P. canopus vollenhovii* Feld. [♂, ♀].

Papilio vollenhovii Felder, *Verh. z. b. Ges. Wien* p. 318. n. 390 (1864) (Arch. mal.; *nom. nud.*); id., *Reise Novara, Lep.* I. p. 97. n. 74. t. 10. f. f (1865); Oberth., *Et. d'Ent.* IV. p. 48. n. 82 (1879) ("Malacca" *loc. err.*); Rothsch., *Nor. Zool.* I. p. 685 (1894) (Timor).

Tailless. Submarginal spots to hindwings and the band somewhat variable.

Hab. Timor (W. Doherty, November to December 1891) (5 ♂, 4 ♀).

(f): *P. canopus alorensis* Rothsch. [♂].

Papilio vollenhovii alorensis Rothschild, *Nor. Zool.* I. p. 686 (1894) (Alor I.).

Tailless. Band of forewings represented by a few spots in the costal and anal regions; discal band of the hindwings narrow.

Hab. Alor Island (W. Doherty, October 1891) (1 ♂).

(g): *P. canopus umbrosus* Rothsch. [♂, ♀].

Papilio vollenhovii umbrosus Rothschild, *Nor. Zool.* I. p. 686 (1894) (Sambawa I.).

Umber-brown; bands of wings almost entirely obliterated; submarginal spots of hindwings well marked, at least below.

Hab. Sambawa (W. Doherty, September 1891) (1 ♂, 1 ♀).

122. *Papilio hipponous* Feld. [♂, ♀].

(?) *Papilio euphyrus* Boisduval, *Bull. Soc. Ent. Fr.* p. 39 (1861) (*nom. nud.*).

Papilio hipponous Felder, *Wien. Ent. Mon.* VI. p. 283. n. 33 (♂, ♀) (1862) (Luzon; Mindanao); id., *Reise Novara, Lep.* I. p. 104. n. 79. t. 15. f. b (♀) (1865) (Luzon; local form of *P. canopus* Westw.?): Koch, *Indo. Austr. Lep. Fauna* p. 62 (1865); Stauding., *Iris* II. p. 12 (1889) (Palawan).

Papilio (Charus) hipponous, Semper, *Philipp., Tayfalt.* p. 275. n. 403 (1892) (Luzon; Bohol; Mindanao).

Two local forms are known:—

(a): **P. hipponous** Feld., forma typ. [♂, ♀].

Varies considerably in size; some specimens approach in size the next race.

Hab. Philippine Islands: Luzon (1 ♂, 1 ♀), Bohol, Mindanao; Palawan (3 ♂, 1 ♀); Banguey (1 ♀ in coll. Staudinger).

(b): **P. hipponous lunifer** Rothsch. [♂].

Papilio hipponous lunifer Rothschild, *Nor. Zool.* I. 687 (1894) (Sangir I.).

Larger than *P. hipponous*; band of hindwings comparatively much narrower; submarginal lunules on the underside of the hindwings larger.

Hab. Sangir Island (W. Doherty) (12 ♂).

123. **Papilio pitmani** Elwes & Nicév. [♂].

Papilio (Laertias) pitmani Elwes & Nicév., *Journ. As. Soc. Beng.* p. 434. n. 129. t. 20. f. 1 (♂) (1886) (Tavoy).

Papilio pitmanii, Rothschild, *Nor. Zool.* I. p. 685 (1894).

Similar to the *male* of *P. polytes* L., but forewings without marginal spots; it looks also somewhat like *P. chaon* Westw., having, like that species, a white mark near the hinder angle on the underside of the forewings, and ochreous submarginal lunules to the underside of the hindwings. I have not had the occasion to examine a specimen of this species, but I believe the best place for it is near *P. sakontala* Hew.

Hab. Tavoy (Tenasserim).

124. **Papilio sakontala** Hew. [♂].

♂. *Papilio sakontala* Hewitson, *Tr. Ent. Soc. Lond.* (2). II. p. 24. t. 5. f. 1 (1852) (Sylhet).

This species differs remarkably from its allies in the elongate shape of the forewings.

In my specimen the discal markings of the upperside of the hindwings (seven in number) are all well marked, much better so than in the type-specimen of the species; and it has no red anal spot above.

Hab. Sylhet; Sikkim (1 ♂).

125. **Papilio polytes** L. [♂, ♀, metam.].

Kleemann, *Beitr.* I. p. 22. t. 2. f. 2. 3 (1761); Edwards, *Glean. N. Hist.* III. p. 277. t. 342 (1764); Gronovius, *Zoophyl.* p. 189. n. 730 (1763-81).

♀⁽²⁾. *Papilio Eques Trojonus polytes* Linné, *Syst. Nat.* ed. x. p. 469. n. 7 (1758) (Asia); Clerck, *Icon. Ins.* I. t. 14. f. 1 (1764) (*an subsp. borealis* Feld. ?); Linné, *Mus. Lud. Ulr.* p. 186. n. 5 (1764) (India); Houtt., *Naturl. Hist.* I. 11. p. 193. n. 7 (1767) (*p.p.*); Linné, *Syst. Nat.* ed. xii. p. 746. n. 5 (1767); Müller, *Naturs.* V. I. p. 567. n. 5 (1774); Fabr., *Syst. Ent.* p. 443. n. 2 (1775); Sulzer, *Gesch. Ins.* p. 141. t. 12. f. 3 (1776); Goeze, *Ent. Beitr.* III. 1. p. 31. n. 5 (1779); Fabr., *Spec. Ins.* II. p. 2. n. 4 (1781); Cramer, *Pap. Ex.* III. p. 129. t. 255. f. c. (1782); Jablonsky, *Naturs. Schmetz.* II. p. 185. t. 15. f. 2. & p. 293. n. 3. t. 2. f. 3. 4 (1784); Esper, *Aust. Schmetz.* p. 50. t. 12. f. 1 (1786) ("♂" *ex err.*); Fabr., *Mant. Ins.* II. p. 1. n. 5 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2227. n. 5 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. 1. p. 2. n. 5 (1793) (*p.p.*); Turt., *Syst. of Nat.* III. 2. p. 6 (1806) (*p.p.*).

♂. *Papilio Eques Trojonus panmon* Linné, *Syst. Nat.* ed. x. p. 460. n. 8 (1758) (Asia); Clerck, *Icon. Ins.* I. t. 14. f. 2 (1764) (*an subsp. borealis* Feld. ?); Linné, *Mus. Lud. Ulr.* p. 189. n. 8 (1764) (India); Houtt., *Naturl. Hist.* I. 11. p. 193. n. 8 (1767); Linné, *Syst. Nat.* ed. xii. p. 746. n. 8 (1767); Müller, *Naturs.* V. I. p. 568. n. 8 (1774) (*p.p.*); Fabr., *Syst. Ent.* p. 445. n. 13 (1775); Goeze, *Ent. Beitr.* III. 1. p. 32. n. 8 (1779); Leske, *Anfangsgr. Nat.* I. p. 451. n. 2 (1779); Fabr., *Spec. Ins.* II. p. 4. n. 16 (1781); id., *Mant. Ins.* II. p. 3. n. 16 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2228. n. 8 (1790) (*p.p.*); Fabr., *Ent. Syst.* III. 1. p. 7. n. 20 (1793) (*p.p.*).

(?) *Papilio Eques gronovii* Scopoli, *Ann. Hist. Nat.* V. p. 112. n. 116 (1772) (*Patrii* ?); Goeze, *Ent. Beitr.* III. 1. p. 32 note (1779); id., *loc.* p. 45. n. 27 (1779).

- ♀. *Papilio Eques Trojannus romulus* Cramer, *Pap. Es.* 1. p. 67. t. 43. f. A (1776) (Coromandel : Ceylon) ; Jablonsky, *Naturs. Schmelt.* 11. p. 145. n. 35 (1784) ; Esper, *Ausl. Schmelt.* p. 105. t. 25. f. 2 (1785-98).
- ♀. *Papilio romulus*, Fabricius, *Spec. Ins.* 11. p. 2. sub n. 5 (1781) (A. *P. hectore* "vix distinctus videtur").
- ♀⁽¹⁾. *Papilio Eques Trojannus pammon*, Esper, *Ausl. Schmelt.* p. 25. t. 4. f. 2 (1785).
- ♀⁽²⁾. *Papilio Eques Trojannus mutius* Fabricius, *Ent. Syst.* III. 1. p. 3. n. 6 (1793) (Tranquebar).
- ♀⁽³⁾. *Papilio Eques Trojannus cyrus* Fabricius, *l.c.* p. 7. n. 19 (1793) (*Patria* ?).
- ♀⁽⁴⁾. *Papilio Eques Trojannus astyanax* Fabricius, *l.c.* p. 13. n. 37 (1793) (India).
- ♀⁽⁵⁾. *Papilio astyanax*, Donovan, *Ins. of India* t. 19. f. 1 (1800) ; Godart, *Enc. Méth.* IX. p. 72. n. 131 (1819) ; Boisd., *Spec. Gén. Lép.* 1. p. 271. n. 95 (1836).
- Princeps heroicus pammon*, Hübner, *Samml. Exot. Schmelt.* 1. t. 109. f. 1. 2 (1806-16).
- ♂. *Laertius pammon*, id., *Verz. bek. Schmelt.* p. 84. n. 861 (1816).
- ♀⁽¹⁾. *Laertius cyrus*, id., *l.c.* p. 84. n. 862 (1816).
- ♀⁽²⁾. *Menelaides romulus*, id., *l.c.* p. 84. n. 865 (1816).
- ♀⁽³⁾. *Menelaides polytes*, id., *l.c.* p. 85. n. 869 (1816).
- ♀⁽⁴⁾. *Papilio mutius*, Godart, *Enc. Méth.* p. 70. n. 125 (1819) ; Boisd., *Spec. Gén. Lép.* 1. p. 270. n. 94 (1836) (Ceylon : Coromandel).
- ♂. *Papilio polites*, Godart, *l.c.* p. 70. n. 126 (1819).
- ♂ ♀. *Papilio pammon*, Boisduval, *Spec. Gén. Lép.* 1. p. 272. n. 96 (1836) ; Doubl. Westw. & Hew., *Gen. Diurn. Lep.* 1. p. 11. n. 62 (1846) (*p.p.*) ; Hutt., *Tr. Ent. Soc. Lond.* V. p. 49 (1847) (*P. pammon* L. & *P. polytes* L. are diff. spec.) ; Alex., *Ent. Mo. Mag.* II. p. 208 (1865) (Central India) ; Wall., *Tr. Linn. Soc. Lond.* XXV. p. 51. n. 62 (1865) (*p.p.*) ; Young, *Entomol.* p. 40 (1866) (Sewalik Hills) ; Moore, *P. Z. S.* p. 696 (1878) (Hainan) ; id., *l.c.* p. 840 (1878) (Tenasserim) ; Oberth., *Et. d'Ent.* IV. p. 47. n. 79 (1879) (*p.p.*) ; Elwes, *P. Z. S.* p. 873 (1881) (*p.p.*) ; Nicév., *Journ. As. Soc. Beng.* p. 52. n. 130 (1885) (Calcutta) ; Butler, *Ann. Mag. N. H.* (5). XVIII. p. 189 n. 49 (1886) (Üpp. Burma) ; id., *l.c.* (6). I. p. 206 (1888) (N.W. India) ; Poujade, *Ann. Soc. Ent. Fr.* p. 49 (1889).
- ♀⁽¹⁾. *Papilio pammon*, Thon, *Nat. Schmelt.* p. 20. t. 7. f. 37 (1837) [*an* ♀⁽¹⁾ *subsp. borealis* Feld. ?].
- ♀⁽²⁾. *Papilio hector*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 39 (♀, *nee* ♂) (1840).
- ♀⁽³⁾. *Papilio romulus*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* 1. p. 10. n. 26 (1846) (Ceylon ; N. India) ; Gray, *Cat. Lep. Ins. B. M.* 1. p. 11. n. 42 (1852) (N. India : Ceylon) ; Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 102. n. 207 (1857) (♂ !!, & ♀) ; Feld., *Verh. z. b. Ges. Wien* p. 319. n. 398. & p. 367. n. 240 (1864) (♀ of *polytes* ?) ; Moore, *P. Z. S.* p. 756 (1865) (Bengal) ; Chbaumette, *Ent. Mo. Mag.* II. p. 37 (1865) (Calcutta).
- ♀⁽⁴⁾. *Papilio polytes* Hutton, *Tr. Ent. Soc. Lond.* V. p. 49 (1847) ; Gray, *l.c.* p. 20. n. 83 (1852) (*p.p.*) ; Horsf. & Moore, *l.c.* p. 103. n. 208 (1857) (*p.p.*) ; ♂ !!, ♀) ; Moore, *P. Z. S.* p. 487 (1865) (N.W. Himal.) ; id., *l.c.* p. 756 (1865) (Bengal) ; Lang, *Ent. Mo. Mag.* 1. p. 101 (1864) (N.W. Himal.) ; Reakirt, *Proc. Ent. Soc. Phil.* p. 468. n. 16 (1864) (*p.p.*) ; Aurivill., *Köngl. Sv. Vet. Akad. Handl.* XIX. 5. p. 11. n. 5 (1882).
- ♀⁽⁵⁾. *Papilio alphenor*, Ménétries (*nee* Cramer, 1779), *Cat. Coll. Ent. St. Petersb.* 1. p. 2. n. 24 (1855) (Ind. or., Himal.).
- ♂ [♀⁽¹⁾ ?]. *Papilio pammon*, Gray, *Cat. Lep. Ins. B. M.* 1. p. 19. n. 82 (1852) (*p.p.*) ; Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 103. n. 208 (1857) (*p.p.*) ; Lang, *Ent. Mo. Mag.* 1. p. 101 (1864) (N.W. Himal.) ; Moore, *P. Z. S.* p. 487 (1865) (N.W. Himal.) ; id., *l.c.* p. 756 (1865) (Bengal).
- Papilio pammon* var. *nikobarus* Felder, *Verh. z. b. Ges. Wien* p. 483. n. 112 (1862) (Nankauri, Nicobar Is.) ; id., *l.c.* p. 319. sub n. 398 (1864) (Sambelong, Nic. Is.) ; Moore, *P. Z. S.* p. 592 (1877) (Nicob. & Andam. Is.) ; Wood-Mas., *Journ. As. Soc. Beng.* p. 237. n. 68 (1880) (Andaman Is.) ; id. & Nicév., *ibid.* p. 253. n. 96 (1881) (Nicobar Is.) ; id., *l.c.* p. 18. n. 61 (1882) (Nicobar Is.).
- ♂ ♀. *Papilio polytes*, Felder, *Verh. z. b. Ges. Wien* p. 318. 393. & p. 367. n. 234 (1864) (*p.p.*) ; Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 253. n. 62 (1869) ; Druce, *P. Z. S.* p. 108. n. 4 (1874) (Siam) ; Butler, *Tr. Linn. Soc. Lond.* (2). Zool. 1. p. 552. n. 12 (1877) (Mal. Pen.) ; Standing. & Schatz, *Exot. Schmelt.* 1. p. 7 (1884) ; Dist., *Rhop. Mal.* p. 347. n. 12. t. 33. f. 7 (♂). 8 (♀). 9 (♀). 10 (♀) (1885) (Mal. Pen.) ; Elwes, *Tr. Ent. Soc. Lond.* p. 429. n. 413 (1888) (Sikkim ; at low elevations only) ; Watson, *Journ. As. Soc. Beng.* p. 268 (1890) (Madras) ; Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 193 (1890) (Shan States : common) ; Davids. & Aitk., *Journ. Bombay N. H. Soc.* p. 366. n. 72 (1890) (*larva & pupa noticed*) ; Nicév., *ibid.* p. 387. n. 90 (1890) (Chin-Lushai) ; Watson, *ibid.* p. 53 (1891) (Chin-Lushai) ; Betham, *ibid.* p. 329 (1891) (Centr. Prov.) ; Robbe, *Ann. Soc. Ent. Belg.* p. 124 n. 5 (1892) (Darjeeling ; Kurseong).

- ♂ ♀. *Papilio polytes* var. *ceylanicus* Felder, *Verh. z. b. Ges. Wien* p. 319. sub n. 393. & p. 367. n. 235 (1864) (Rambodde, Ceylon).
- ♂ ♀. *Laertias romulus*, Moore, *Lep. Ceylon* I. p. 150. t. 59. f. 1 (♂). 1a (♀). 1b (♀). 1c (♀) (1881) (Ceylon).
- ♂. *Papilio pammon*, Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XIX. 5. p. 13. n. 8 (1882).
- ♂ ♀. *Laertias pammon*, Moore, *P. Z. S.* p. 259 (1882) (N.W. Himal.) : Swinh., *ibid.* p. 145. n. 140 (1885) ; (Bombay & Deccan ; common everywhere ; larva & pupa noticed) ; id., *l.c.* p. 433. n. 96 (1886) (Mhow).
- ♂ ♀. *Papilio (Laertias) polytes*, Swinhoe, *l.c.* p. 512. n. 60 (1884) (Kurrachee) ; Hamp., *Journ. As. Soc. Beng.* p. 363. n. 201 (1888) (Nilgiri Hills, 1000 to 7000 feet ; 3 forms of ♀) : Fergus., *Journ. Bombay N. H. Soc.* p. 446 (1891) (Tranvancore).
- ♂ ♀. *Laertias polytes*, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 51 (1889) (Mergui) ; Swinh., *Tr. Ent. Soc. Lond.* p. 313. n. 387 (1893) (Khasia Hills).
- ♂ ♀. *Papilio (Laertias) polites*, Doberty, *Journ. As. Soc. Beng.* p. 137. n. 233 (1886) (Kumaon).

This variable polymorphic *Papilio* has developed into a number of geographical forms, which inhabit an area extending from Ceylon, North-West India, and Northern China to the Moluccas and the Timor group of islands ; in the islands further east, and in North Australia, it is represented by *P. ambrax* Boisd., of which the females come often very close to that sex of *P. polytes* and have been recorded under the latter name (see *P. ambrax*). In the Tenimber Islands neither *P. polytes* L. nor *P. ambrax* Boisd. have as yet been found ; Letti, Kisser, and Babber are inhabited by *P. polytes*, the Aru and Key Islands by *P. ambrax*.

There are two groups of races of *Papilio polytes* L., which can be separated in the *mule* sex as follows :—

A. Hindwings, underside, with blue scales in the posterior region behind the discal white spots.

- (a) : *P. polytes* L. from India, Ceylon, Andaman and Nicobar Islands, Malay Peninsula, Deli (Sumatra), Burma, Siam, Tonkin ;
 (b) : *P. polytes borealis* Feld. from China and the Loo Choo Islands ;
 (c) : *P. polytes theseus* Cram. from the larger and lesser Sunda Islands ;
 (d) : *P. polytes alcindor* Oberth. from Saleyer and Celebes.

B. Hindwings without blue scales behind the discal band beneath ; sometimes there is a slight trace of the blue scaling.

- (e) : *P. polytes alphenor* Cram. from the Southern Moluccas, Sula Islands, Philippine Islands, Sulu Islands, Palawan, and North Borneo ; Pelew Islands ;
 (f) : *P. polytes perversus* mihi from Sangir and Talaut ; Siao Islands ;
 (g) : *P. polytes nicunor* Feld. from the Northern Moluccas.

The females of the two groups of races run into one another.

Each of these seven local races into which I have divided *P. polytes* L. has one form of the *male* sex, which is, however, variable in *P. polytes theseus* Cram. in respect to the development of the tails, and at least two forms of the other sex, in every locality except Celebes ; these *female*-forms occur together at the same time of the year, though the observations about this fact are very scanty and differ from each other ; and it has been proved by rearing that one *female* produces at least two *female*-forms. On the whole we can say for certain that (1) the different *females* are neither true seasonal forms nor always confined to certain places, as valleys or hills, open land or forest, swamps or desert land, etc. ; (2) that two forms can be produced by one *female*-specimen.

We have, therefore, an example of true polymorphism before us, which is very

much complicated by the appearance of an additional third *female*-form in certain parts of the area inhabited by *P. polytes*, while this third form is absent from other parts of the area, or is represented by a different third form.

So we have *P. polytes* ♀-f. loc. *romulus* Cram. in Ceylon, South India, and Bengal, which does not occur in the other parts of the range of *P. polytes* (Burma, Siam, etc.); the *males* and the first and second form of the *female* from Ceylon, South India, and Bengal are not distinguishable from those from Burma, Siam, etc.

The *males* and the first form of the *female* of *P. polytes theseus* Cram. from West Sumatra, Java, Sambawa, Timor, are the same; the second *female*-form of the lesser Sunda Islands is different from the corresponding form from the larger Sunda Islands; the third *female* is not known from Timor and the adjacent islands.

On Palawan and West Luzon the second form of the *female* (with white on the hindwings) is extremely rare, and the third form (without white on the hindwings) is common; on the other islands of the Philippine group the second form is prevailing, and the third apparently absent or at least very scarce; the *males* as well as the first *female*-form from these localities are inseparable.

The *mules* and the first *female*-form from the Philippine Islands and Palawan are the same as those from the Southern Moluccas; in this latter locality a third *female*-form is wanting; the examples of the second form are nearly always distinguishable.

Now, have we to treat *P. polytes* from Ceylon, South India, and Bengal with the ♀-f. loc. *romulus* as a subspecies by itself, or must it be united to *P. polytes* from Assam, Burma, etc., which has the same *male* and the same first and second *female*-forms, but not the third *female*? Can *P. polytes theseus* from Timor and the adjacent islands stand as a subspecies by itself on account of one of its *female*-forms being different from the corresponding one from other parts of the range of *P. polytes theseus*, or has it to stand as *P. polytes theseus*? Is the so-called *P. ledebourius* Eschsch. from the Philippine Islands subspecifically distinguishable from Cramer's *P. alphenor* from the Southern Moluccas, though the *males* and the first form of the *female* are the same, and only the second form is mostly different?

Although I shall always keep two locally separated insects under two subspecific names, even if they differ only in one sex, I cannot do so in these cases, where the differences, though restricted to certain localities and therefore localised as they are in subspecies, are exhibited only by a relatively very small proportion of the number of the individuals; to make, however, the division of *P. polytes* more satisfactory, and to indicate that the above-mentioned localised forms of the *female* are "local forms," I shall use for these *females* the term ♀-f. loc. (*♀-forma alienius loci*).

It is certainly highly remarkable that the same insects produce in Ceylon and South India such a conspicuous *female* as is the ♀-f. loc. *romulus*, while they never do so in Burma, Siam, etc.; the parents of *romulus* ought to exhibit some characters distinguishing them from the specimens flying in North India, Burma, etc., and the absence of such characters must, rather unsatisfactorily, be explained by the *males* and first and second *female*-forms not assuming any new characters in consequence of strong atavism.

(a): *P. polytes* L., forma typ. [♂, ♀, metam.].

Linneé described the present species from a *female*; a Linnean specimen which is (according to Aurivillius, *l.c.*) still preserved in the Stockholm Museum differs

from Cramer's figures (*l.c.*, t. 265. f. A. B) in those points in which many Indian individuals differ from the Chinese race, which latter Cramer's figures represent. It is therefore certainly right to apply the name of *polytes* to the Indian race.

Felder separated two local forms from *P. polytes* L., namely *P. polytes* var. *nikobarus* Feld. (*l.c.*) and *P. polytes* var. *ceylanicus* Feld. (*l.c.*). Though I have not seen a very large series of *P. polytes* from the Andaman Islands, and only a few specimens from the Nicobar Islands, I am convinced that *nikobarus* cannot stand as a subspecies; the characters by which Felder separates it are found only in some of the specimens and appear also in Indian examples. On the whole the Andaman specimens seem to be a little larger than the average specimens from India, though certain Indian specimens are larger than the largest from the Andaman Islands. Felder's *ceylanicus* is certainly identical with *P. polytes* L.

♂. Tails slightly variable, always spatulate; hindwings sometimes with a reddish mark on the upperside at the anal angle. Marginal spots of the forewings variable in size and shape. Costal spot of the median band of the hindwings often linear on the underside. The submarginal spots of the hindwings appear seldom on the upperside.

♀. Tails spatulate, mostly longer than in the *male*.

(*a*¹): ♀-f. *cyrus* Fabr., *l.c.* [figs.: Moore, *Lep. Ceylon, l.c.*; Distant, *Rhop. Mal., l.c.*].

Similar to the *male*.

(*b*¹): ♀-f. *polytes* L., *l.c.* [figs.: Moore, *l.c.*; Dist., *l.c.*].

Hindwings with a white discal patch, which consists of four circumcellular and one intracellular spot.

(*a*²): ♀-ab. *stichius* Hübn.

Papilio Eques Trojannus polytes, Cramer (*nec Linné*, 1758), *l.c.* p. 129. t. 265. f. c (1782).

Princeps heroicus stichius Hübner, *Samml. Ex. Schm.* I. t. 112 (1806-16).

Meneides alphenor, Hübner, *Verz. bek. Schm.* p. 85. n. 870 (1816) (*p.p.*).

Papilio polytes L. ♀, forma *stichius*, Aurivillius, *Kongl. Sc. Vet. Ak. Handl.* XIX. 5. p. 12. sub n. 5 (1882).

Differs from the typical ♀-f. *polytes* in the white area of the hindwings not extending into the cell. Sometimes the number and size of the white spots is much reduced; the spots are often partly replaced by red, but the white does not disappear entirely.

(*c*¹): ♀-f. loc. *romulus* Cram., *l.c.* t. 43. f. A [fig.: Moore, *l.c.*].

Mimics *Papilio hector* L. and inhabits the same area as that species. I found two specimens in the Möller collection from Sikkim, one of which has the white of the forewings much less conspicuously marked and comes in the colour of these wings indeed close to certain specimens of ♀-f. *polytes*; in the same example the red spot in the cell of the hindwings is tinged with orange.

Found in Ceylon, South India, Bengal, and occasionally in Sikkim.

Hab. India (including South Cashmere; 19 ♂, 34 ♀); Burma (12 ♂, 9 ♀); Shan States (1 ♂, 1 ♀); Tenasserim; Siam; Lower Tonkin (3 ♂, 7 ♀); Malay Peninsula (5 ♂, 7 ♀); Sumatra (Deli); Ceylon (2 ♂, 10 ♀); Andaman Islands (3 ♂, 1 ♀); Nicobar Islands (2 ♂, 1 ♀).

Papilio astyanax Fabr., *l.c.*, is certainly based on a specimen of ♀-f. loc. *romulus* with the tails broken off.

(b): *P. polytes borealis* Feld. [σ , φ].

- σ . *Papilio Eques Trojanius pammon*, Cramer (nec Linné, 1758), *Pap. Ex.* II. p. 69. t. 141. f. B (1779) (*hæc subspec.?*); Jablonsky, *Naturs. Schm.* II. p. 276. n. 53. t. 19. f. 4 (1784).
- φ ¹². *Papilio Eques Trojanius polytes*, Cramer, l.c. p. 129. t. 265. f. A. B (1782) (China: " σ " *ex err.*).
- φ ¹¹. *Papilio Eques Trojanius pammon*, Stoll, in Cramer's *Pap. Exot. Suppl.* p. 147. t. 33. f. 1. 1A (1791) (China).
- σ φ . *Papilio pammon*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 62 (1852) (*p.p.*); Wall. & Moore, *P. Z. S.* p. 356 (1866) (Formosa); Oberth., *Et. d'Ent.* IV. p. 47. n. 79 (1879) (*p.p.*); Elwes, *P. Z. S.* p. 873 (1881) (*p.p.*); Oberth., *Et. d'Ent.* XI. p. 14 (1886) (Ta-t sien-lu).
- σ φ . *Papilio polytes* var. *borealis* Felder, *Wien. Ent. Mon.* VI. p. 22. n. 2 (σ , φ) (1861) (Ning-po); Bntler, *P. Z. S.* p. 814 n. 37 (1877) (Formosa); Leech, *Tr. Ent. Soc. Lond.* p. 65 (1889) (Kiu-Kiang).
- σ φ . *Papilio polytes*, Leech, *Bull. from China*, etc. p. 552 (1893) (China; Loo Choo Is.).
- σ φ . *Papilio borealis*, Seitz, *Soc. Ent.* X. p. 41 (1895) [China, excl. of the South; Okinawa; Nagasaki; "Yokohama (Pryer)" *ex err.*].

σ . Differs from *P. polytes* in the spots of the median band of the hindwings being much smaller, also often reduced in number; the submarginal spots of the hindwings appear often above, and are sometimes of a reddish colour.

(b²): ab. *thibetanus* Oberth.

Papilio pammon var. *thibetanus* Oberthür, *Et. d'Ent.* XIII. p. 14 (1886) (Chapa).

Spots of the median band of the hindwings partly obliterated.

I have this aberration, which is the extreme form of *borealis*, from China and the Loo Choo Islands; in one Chinese specimen there are only two white markings left on the underside.

φ . Tails mostly broader than in typical *polytes*. Dimorphic; third female wanting.

(d¹): φ -f. *mandane* mihi.*

Differs from *P. polytes* φ -f. *cyrus* Fabr. in the same way as the males of *borealis* do from those of *polytes*.

Very rare in Western China, more abundant in the Loo Choo Islands.

(e¹): φ -f. *borealis* Feld., l.c.

Mostly indistinguishable from *P. polytes* φ -f. *polytes* L. and ab. *stichius*; the dominant form corresponds with ab. *stichius*; the number of white spots of the hindwings is reduced; the spots are widely separated; the intracellular spot is never so large as it usually is in φ -f. *polytes*.

In several of my specimens the median row of white spots of this female-form, as well as of φ -f. *polytes*, is connected with the costal margin by means of some very faint additional markings of a buffish brown colour, thus recalling the complete row of spots in the female *maris colore*.

Hab. China (except the southern parts) (18 σ , 19 φ); Kiu-Shiu; Loo Choo Islands (23 σ , 14 φ); Formosa (2 σ , 1 φ); Hainan (1 σ).

The specimens from the Loo Choo Islands have the tails sometimes rather short and even non-spatulate, and come very close to certain specimens of *P. polytes* L. from the Natuna Islands, forming a transition to *P. polytes theseus* Cram.

* For the sake of conformity all the female-forms of the various subspecies of *P. polytes* L. are treated under names of their own.

(c): *P. polytes theseus* Cram. [♂, ♀, metam.]

- Seba, *Thes.* IV. p. 34. t. 25. f. 21-24. & p. 50. t. 41. f. 11. 12 (1765); id., *lc.* p. 42. t. 34. f. 23. 24 (1865) (*haec subsp.*?).
- ♀⁽⁴⁾. *Papilio Eques Trojanus theseus* Cramer, *Pap. Ex.* II. p. 128. t. 180. f. B (1779) (Sumatra occ.); Goeze, *Ent. Beytr.* III. 1. p. 44. n. 21 (1779); Fabr., *Spec. Lus.* II. p. 2. n. 3 (1881); Jablonsky, *Naturs. Schmett.* II. p. 162. n. 39. t. 14. f. 3 (1784); Fabr., *Ent. Syst.* III. 1. p. 2. n. 4 (1793).
- ♂. *Papilio nuna* Weber, *Obs. Ent.* p. 106 (1801) (Sumatra).
- ♀⁽⁴⁾. *Melanaides theseus*, Hübner, *Verz. bek. Schw.* p. 84. n. 867 (1816).
- ♀⁽⁴⁾. *Papilio theseus*, Godart, *Enc. Méth.* IX. p. 71. n. 127 (1819); Boisd., *Spec. Gén. Lép.* I. p. 276. n. 99 (1836) (Sumatra); Doubl. Westw. & Hew., *lc.* p. 11. n. 63 (1846).
- ♂ ♀. *Papilio pammou*, Godart, *lc.* p. 74. n. 139 (1819) (*p.p.*); Boisd., *lc.* p. 272. n. 96 (1836) (*p.p.*); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 41 (1840) (*p.p.*); Doubl. Westw. & Hew., *lc.* p. 11. n. 62 (1846) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 79. n. 79 (1860) (*p.p.*); Godm. & Salv., *P. Z. S.* p. 641 (1878) (Billiton I.).
- ♂. *Papilio pammou*, Horsfield, *Cat. Lep. Ins. Mus. E. I. C.* t. 3. f. 2 (*l.*). 2a (*p.*) (1828); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 104. n. 209 (*p.p.*). & t. 3. f. 4 (*l.*). 4a (*p.*) (1857); Reakirt, *Proc. Ent. Soc. Phil.* p. 466. n. 15 (1864) (*p.p.*).
- ♀⁽²⁾. *Papilio polytes*, Horsf., *lc.* t. 3. f. 1 (*l.*). 1a (*p.*) (1828); Horsf. & Moore, *lc.* p. 103. n. 208 (*p.p.*). & t. 3. f. 3 (*l.*). 3a (*p.*) (1857); Reakirt, *lc.* p. 468. n. 16 (1864) (*p.p.*).
- ♂. *Papilio tedcbourus*, Zinken, *Nov. Act. Ac. Nat. Cur.* XV. p. 148. n. 5 (1831) (Java).
- ♀⁽³⁾. *Papilio polyphontes* De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 39 (♀, nec ♂). t. 8. f. 4 (1840) (Timor).
- ♀⁽⁴⁾. *Papilio antiphus* De Haan, *lc.* p. 40 (♀, nec ♂). t. 8. f. 2 (1840) (Pontianak; Banjermassin; Padang).
- ♀⁽²⁾. *Papilio polytes* var. *javanus* Felder, *Verh. z. b. Ges. Wien* p. 486. n. 127 (1862).
- ♂ ♀. *Papilio polytes* var. *nuna*, Felder, *lc.* p. 319. sub n. 393 (1864) (Sumatra).
- ♀⁽³⁾. *Papilio polytes* var. *timorensis* Felder, *Verh. z. b. Ges. Wien* p. 319 (1864) (Timor; nom. nov. loco "polyphontes De Haan").
- ♂ ♀. *Papilio theseus*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 52. n. 63. t. 2. f. 2. 4. 7 (1865) (Borneo; Sumatra; Java; Lombok; Timor; nec Macassar).
- ♂ ♀. *Papilio polytes*, Piepers, *Tijdschr. v. Ent.* p. 156. n. 71 (1876) (Batavia); id., *lc.* p. 352. t. 8. f. 6. 7. 8 (*l., p.*) (1888) (life hist.); Snellen, *ibid.* p. 304. n. 74 (1890) (Billiton); id., *ibid.* p. 250. n. 48 (1891) (Flores); Hagen, *Iris* VII. p. 22. n. 18 (1894) (Sumatra).
- ♂ ♀. *Papilia (Luertius) polites*, Doherty, *Journ. As. S. Beng.* p. 193. n. 115 (1891) (Sumba; Sambawa).
- ♂⁽¹⁾. *Papilio polytes* ab. *virilis* Röber, *Tijdschr. v. Ent.* XXXIV. p. 272 (1891) (Kisser; Maumerie).
- ♂ ♀. *Papilio pammou-polytes* (?), Hagen, *Berl. Ent. Zeit.* XXXVII. p. 154. n. 170 (1892) (Banka I.); id., *Iris* VII. p. 22. n. 18 (1894) (*p.p.*; W. Sumatra; larva noticed).

As I have already said above, I cannot separate *P. polytes* from the larger and the lesser Sunda Islands into several subspecies; if somebody is more successful in finding distinguishing characters, he will have an ample supply of names for the races: *P. theseus* Cramer (W. Sumatra), *P. melanaides* De Haan (Borneo), *P. javanus* Feld. (Java), *P. polyphontes* De Haan and *timorensis* Feld. (Timor), *P. polytes* ab. *virilis* Röber (Kisser, Maumerie).

The *polytes* from East Sumatra (Deli) stand mostly intermediate between the Indian and the insular races, as do many specimens from the Natuna Islands.

P. polytes theseus Cram. is the smallest race of *P. polytes* L.

♂. Tails more or less reduced, sometimes absent. The Sambawa examples have the white band of the hindwings rather narrower than specimens from other localities.

♀. Four forms, but only the first seems to be generally distributed.

(f¹): ♀-f. *virilis* Röber, *lc.*

Similar to the *nuda*.

(y¹): ♀-f. *javanus* Feld., *lc.*

Smaller than the average specimens of *P. polytes* ♀-f. *polytes* L.; the white

spot within the cell of the hindwings small. Not constantly distinguishable from *P. polytes* L.

This is the usual form in Java; in Sumatra and Borneo it is rare, and is replaced by the fourth form, which is apparently absent from Java.

(*b*¹): ♀-f. loc. *polyphontes* De Haan, *l.c.*

The pale area of the forewings is much whiter than in the preceding form; the apical third of the cell of the hindwings is white, the white markings round the cell are large, the nervules traversing the white area are partly orange. In a specimen from Letti, the cellular spot is still large, but tinged with orange; the other markings are, however, partly obliterated, there being only three very feeble spots between the lower median and lower discoidal nervules, of a buffish colour, and widely separated.

Inhabits Timor, Letti, Moa, and probably all the other islands of the Timor group.

(*b*¹): ♀-f. loc. *theseus* Cram., *l.c.*

Without white on the hindwings. Discal spots often completely obliterated.

The commonest form in Sumatra and Borneo; mimics *P. aristolochiae antiphus* Fabr.

In the Bornean specimens the discal and submarginal red spots of the hindwings are sometimes merged together to longitudinal streaks; this variety is—

(*b*²): ♀-ab. *melanides* De Haan.

Papilio melanides De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 40. t. 8. f. 3 (1840) (Banjermassin: S. Borneo).

I have not seen a specimen so much aberrant as that figured by De Haan, but several which come rather close to it.

Hab. Sumatra (excl. North-East Sumatra); Natuna Islands (17 ♂, 6 ♀; the specimens belong partly to this, partly to the typical race); Borneo (4 ♂, 9 ♀); Nias; Java (6 ♂, 5 ♀); Lombok; Bonerate; Sambawa (7 ♂); Sumba; Flores; Pura (1 ♂); Timor (4 ♂, 2 ♀); Maumerie; Kisser; Letti (1 ♂, 1 ♀); Babber (1 ♂); Moa (1 ♀, in coll. Staudinger).

(*d*): **P. polytes alcindor** Oberth. [♂, ♀, larva].

♂ ♀. *Papilio alpheus*, Wallace, *l.c.* p. 53 (1865) (*p.p.*); Piep. & Snell., *Tijdschr. v. Ent.* XXI. p. 39. n. 156 (1878) (Celebes; common; caterpillar the same as that of the Javan *P. polytes*); Holland, *Proc. Bost. N. H. Soc.* XXV. p. 77. n. 128 (1890) (S. Celebes); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

♀. *Papilio pannon* var. *alcindor* Oberthür, *Et. d'Ent.* IV. p. 48. & p. 113. sub n. 79. t. 6. f. 4 (1879) (Celebes).

♂ ♀. *Papilio alcindor*, Semper, *Philipp., Tagfalt.* p. 276 (1892) (distinct species).

♂ ♀. *Papilio alpheus* var. *thesalpheus* Staudinger, *Iris* VII. p. 343 (1895) (Saleyer).

This race is the most aberrant and constant, and I should have treated it as a distinct species, if it were not for the very small specimens which are scarcely distinguishable from *P. polytes* or *P. polytes theseus* Cram., and the caterpillar, which is, according to Piepers (*l.c.*), the same as that of *theseus*.

The *female* is monomorphic, and mimics *Papilio polyphontes* Boisid.

♂. Tails somewhat variable in length and breadth, sometimes wanting, according to Staudinger (*l.c.*); hindwings seldom with submarginal spots above. Some specimens have a small white spot in the apex of the cell to the hindwings.

♀. In small specimens the tails are thinner, as in the usual large form: the discal extracellular spots are always widely separated.

Staudinger has overlooked that Oberthür figured his *alcinolor*; the Säleyer specimens agree very well with Oberthür's figure.

Hab. Celebes (5 ♂, 4 ♀); Säleyer (2 ♂, 2 ♀).

While most *Papilio*s from the small islands north of Celebes (Sangir and Talaut Islands), and from Bangkei and the Sula Islands, are either identical with the Celebesian races or bear at least a much closer relationship to them than to the races from the Moluccas and Philippines, this is not the case in *P. polytes*; and it is most curious that *P. polytes*, from the Moluccas and the Sula Islands in the south, and from the Philippine Islands in the north, must stand as the same subspecies, while the islands of Sangir and Talaut, which lie just between those groups of islands, are inhabited by a different race.

(e): *P. polytes alphenor* Cram. [♂, ♀, metam.].

(?). *Papilio Eques gronovii* Scopoli, *Ann. Hist. Nat.* V. p. 112. n. 116 (1772) (*Patriu*?).

♀⁽²⁾. *Papilio Eques Trojanus alphenor* Cramer, *Pap. Ex.* I. p. 141. t. 90. f. B (1775) ("China" *err. loc.*); Goeze, *Ent. Beytr.* III. 1. p. 77. n. 28 (1779); Jung, *Verz. Schm. all. Weltth.* p. 24 (1791); Esper, *Aust. Schmett.* p. 141. t. 37. f. 1 (1785-98) (*cop. from Cram.*).

♀⁽²⁾. *Papilio Eques Trojanus polytes*, Fabricius (*acc. Linné*, 1758), *Spec. Ins.* II. p. 2. n. 4 (1781) (*p.p.*).

♀⁽²⁾. *Papilio Eques Trojanus polytes var. alphenor*, Jablonsky, *Naturs. Schmett.* p. 195 (1784).

♀⁽²⁾. *Papilio polytes var. β alphenor*, Gmelin, *Syst. Nat.* I. 5. p. 2227. sub n. 5 (1790).

Menelaides alphenor, Hübner, *Verz. bek. Schm.* p. 85. n. 870 (1816) (*p.p.*).

♀⁽²⁾. *Papilio polytes var.*, Godart, *Enc. Méth.* IX. p. 71. n. 126 (1819).

♂. *Papilio ledebourii* Eschscholtz, *Kotzebue's Reise* III. p. 206. t. 3. f. 7 (♂) (1821) (Philipp.).

♀⁽²⁾. *Papilio pammon var. (?) alphenor*, De Haan, *Lc.* p. 41 (1840).

♀⁽²⁾. *Papilio alphenor*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 65 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M. I.* p. 20. n. 85 (1852) (*p.p.*).

♀⁽⁴⁾. *Papilio elyros* Gray, *List Lep. Ins. B. M. I.* p. 26. n. 91 (1856) (Philippine Is.; *nom. nud.*).

♂ ♀. *Papilio alphenor*, Felder, *Verh. z. b. Ges. Wien* p. 319. n. 395. & p. 367. n. 239 (1864) (Amboina; Ternate); id., *Reise Novara, Lep.* I. p. 101. n. 77 (1865); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 53. n. 64 (1865) (*p.p.*; Buru; Amboina; Ceram; Philippine Is.; *acc. Celebes*); Semper, *Journ. Mus. Godeffr.* II. p. 59. t. 8. f. 1-3. 15-18 (*l., p.*) (1873); Dewitz, *Nor. Act. Cur. Ac. Nat.* 44. 2. p. 264. t. 9. f. 1. 1A. 1B (*l., p.*) (1882); Pagenst., *Jahrb. Nass. Ver. Nat.* p. 202 (1884) (*p.p.*); Stauding., *Iris* p. 277 (1888) (Palawan); id., *Lc.* II. p. 11 (1889) (Palawan).

♂ ♀. *Papilio (Lurttias) alphenor*, Semper, *Philipp., Taqf.* p. 276. n. 404 (1892) (Philippine Is.; Pelew Is.; Caroline Is., *the same subsp.?*).

♀⁽²⁾. *Papilio alphenor*, Reakirt, *Proc. Ent. Soc. Phil.* p. 470 (1864) (Philippines).

♂ ♀⁽¹⁾. *Papilio horstfeldii* Reakirt, *Lc.* p. 476 (1864) (Philippine Is.).

♀⁽²⁾. *Papilio ledebourii*, Felder, *Reise Novara, Lep.* I. p. 99. n. 76 (1845) (Luzon).

♀⁽⁴⁾. *Papilio alphenor* 3rd form of *female (P. elyros)*, Wallace, *Lc.* p. 53. sub n. 64 (1865) (Philippine Is.).

♂ ♀. *Papilio pammon*, Semper, *Verh. z. b. Ges. Wien* p. 697 (1867) (Philippine Is.).

♀⁽²⁾. *Papilio pammon var. alphenor*, Oberthür, *Et. d'Ent.* IV. p. 48. sub n. 79 (1879) ("Celebes" *loc. err.*).

♂ ♀. *Papilio ledebourii*, Oberthür, *Lc.* p. 48. n. 80 (1879) ("Celebes" *loc. err.*); Butl., *Ann. Mag. N. B.* (5). XI. p. 423. n. 79 (1883) (Mindoro).

♂ ♀. *Papilio micaur*, Ribbe, *Iris* II. p. 209. n. 6 (1890) (Ceram).

Scopoli's *P. gronovii* may be this local form of *P. polytes* L. He describes it as having yellow instead of white markings, and says: "*Hic proximus Papilio Pammon* Linné, *Mus. Reg.* p. 189"; he does not say anything about the form of the hindwings; but as Scopoli received his specimen from Gronovius who himself describes the *male* of *P. polytes* as being tailed [*Zoophyl.* p. 189. n. 73 (1763-81)], it is certainly best to treat *gronovii* as a query synonym.

The figures which Semper (*l.c.*) and Dewitz (*l.c.*) give of the caterpillar of this subspecies of *P. polytes* L. differ from those of the caterpillar of *P. polytes theseus* (see Horsfield, *l.c.*, and Piepers, *l.c.*) in the two transverse oblique bands of the abdomen being complete; in consequence of this difference, and of the fact that the *males* of *P. polytes* L. and *theseus* Cram. on the one side, and those of Cramer's *P. alphenor* and Felder's *P. nicanor* on the other, are constantly, though slightly, different, Semper, *l.c.*, treats the present *Papilio* as a distinct species. Are the caterpillars really not liable to variation? Caterpillars from Borneo and India ought to be compared. The imagines of *alphenor* and *polytes* are constantly distinguishable from one another certainly only in the *male* and the first form of the *female*.

♂. Tailless. The median band of the hindwings varies in breadth; sometimes there is an orange-red anal ocellus on the upperside; the submarginal spots of the underside of the hindwings are white, often yellowish (in *P. polytes* L. they are often also white).

♀. Tetramorphic, but only the first *female* inhabits the whole of the area occupied by this subspecies.

(*k*): ♀-f. *horsfieldi* Reak., *l.c.*

Similar to the *male*. Hindwings with submarginal spots on the upperside.

This form stands often as *female* of *nicanor* in collections; it occurs in the Philippines and Southern Moluccas.

(*l*): ♀-f. *alphenor* Cram., *l.c.*

With white discal spots on the hindwings; the nervules traversing the white patch are very thinly covered with reddish and black scales, as in *P. polytes theseus* ♀-f. loc. *polyphontes* De Haan; the size and number of the white spots vary. Intermediate examples between this and the next *female*-form come chiefly from Luzon. Forewings mostly whiter in the outer region than in *P. polytes* L. Tails prominent, but non-spatulate. The specimens with spatulate tails, which are dominant in the Philippine Islands and Sula Islands, must stand as—

(*m*): ♀-f. loc. *lelebourius* Eschsch., *l.c.*; Feld., *l.c.*

This form does not occur on the Southern Moluccas. I have not seen specimens from the Philippines with the tails shaped as in typical *alphenor*, but Semper (*l.c.*) records them from there.

(*n*): ♀-f. loc. *elyros* Wall., *l.c.*

Corresponds to *P. polytes theseus* ♀-f. *theseus* Cram. and is not always distinguishable from it; in most specimens the internervular pale stripes of the forewings are whiter than in that form.

Almost (or entirely?) confined to the islands of Palawan and Luzon; it will probably also be found on Mindoro, Balabac, Banguey, and North Borneo; it mimics *P. aristolochiae antiphus* Fabr., *acutus* Druce, and *kotzebuens* Eschsch., which inhabit the same districts. On Luzon, where *elyros* sometimes has a white mark on the hindwings, the *P. aristolochiae kotzebuens* Eschsch. is also sometimes provided with the same character. On the Moluccas and the Sula Islands this *female*-form is not found.

Hub. Amboina (1 ♂, 4 ♀); Saparua (2 ♀); Ceram (1 ♀); Buru; Sula Islands (Mangola Island; 4 ♂, 7 ♀); Banka Island (1 ♂); Philippine Islands (19 ♂, 18 ♀);

Palawan (2 ♂, 5 ♀); Sulu Islands; Balabac (2 ♂); North Borneo (Lawas, Baram R., Mantanani Island; 3 ♀).

In the Bornean specimens (♀-f. *horsfieldi* only) the costal spot of the band of the hindwings is linear, being much narrower than in Philippine individuals; the marginal spots of the forewings are of rather large size. *Males* of *alphenor* from North Borneo I have not seen; the Balabac *males* agree with those from Palawan and the Philippines.

The Sula specimens are not exactly identical with *alphenor*, but approach a little the below-described *P. polytes perversus*, from the islands north of Celebes; in the *male* the costa is in large specimens strongly arched; the spots of the band to the hindwings are a little more separated from one another than in Philippine examples. The tails of ♀⁽²⁾ are a little less spatulate than in typical ♀-f. loc. *lelebourius* Eschsch.

My Banka Island *male* agrees with the Sula Islands specimens.

(f): *P. polytes perversus* subsp. nov. [♂, ♀].

♂ ♀. *Papilio alphenor*, Hopffer (nec Cramer, 1776), *Stett. E. Zeit.* p. 20. n. 13 (1874) (Siao Is.); Semper, *Philipp., Tagf.* p. 276. n. 404 (1892) (*p.p.*: Sangir Is., Siao Is.).

♂ ♀. *Papilio nicanor*, Oberthür (nec Felder, 1865), *Et. d'Ent.* IV. p. 48. n. 81 (1879) (*p.p.*: Sangir).
(?) *Papilio polytes*, Westwood (nec Linné, 1758), *Tr. Ent. Soc. Lond.* p. 468. n. 2 (1888) (Talisie I., north of Celebes; an *alcindor* Oberth.?).

♂. Forewings with the costal margin more arched than in *P. polytes alphenor* Cram., similar in shape to those of *P. polytes alcindor* Oberth. Marginal white spots as in *P. polytes nicanor* Feld.

Hindwings tailless, but almost triangular, longer than in the other races of *P. polytes*, the whole anal region being rather produced. The median band is narrow; the two anterior spots are the largest, the second is much broader anteriorly than at the upper discoidal nervule. The submarginal spots of the underside of the hindwings are sometimes very faintly indicated above by a few brownish and whitish scales.

(a'): ♀-f. *martius* mihi.

Similar to the *male*; submarginal spots of the underside of the hindwings large in my single specimen, with a faint anal red mark above.

(p): ♀-f. *atarus* mihi.

With spatulate tails. Forewings with costal margin arched as in the *male*, with clearly marked marginal spots, which are shaped as in the *male*, but rather larger; outer half of the wing whiter than in *P. polytes alphenor* ♀-f. loc. *lelebourius*. Hindwings with three large and one small white discal spot, which are separated from each other by the black nervules; within the apex of the cell is sometimes also a minute white spot; submarginal spots rather large and strongly arched.

Hab. Sangir Island (W. Doherty *leg.*) (8 ♂, 2 ♀); Talant (W. Doherty *leg.*) (8 ♂, 2 ♀); Siao Island (the same?).

Semper, *l.c.* p. 277 note, says that he has ♂♂ and ♀♀ from Sangir which are indistinguishable from specimens of *nicanor* from Morotai, Batjan, and Ternate; the specimens which I have seen are all well distinguishable from *nicanor*.

(g) : *P. polytes nicanor* Feld. [♂, ♀].

- ♂ ♀. *Papilio alphenor*, Boisduval (*acc.* Cramer, 1779), *Spec. Gén. Léop.* I. p. 274. n. 97 (1836) ("Celebes" *loc. err. aut subsp. alt.*).
- ♂ ♀. *Papilio nicanor* Felder, *Verh. z. b. Ges. Wien* p. 319. n. 396 (1861) (Batjan; Halmahera; *nom. nud.*); id., *Reise Novara, Lep.* I. p. 102. n. 78. t. 10. f. c. d (1865) (Batjan); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 53. n. 65 (1865) (Batjan; Gilolo; Morty); Oberth., *Et. d'Ent.* IV. p. 48. n. 81 (1879) (*p.p.*); id., *Ann. Mus. Civ. Genova* XV. p. 474. n. 17 (1880) (Halmahera; Ternate); Standing & Schatz, *Erzt. Schu.* I. p. 7. t. 3 (♂, ♀) (1884); Butl., *Ann. Mag. N. H.* (5). XIII. p. 197. n. 44 (1884) (Ternate).

♂. Tailless; hindwings with submarginal spots on the upperside; marginal spots of the forewings large, strongly hammerhead-shaped.

♀. Monomorphic, as far as we know at present; similar to *P. polytes alphenor* ♀-f. *alphenor* Cram., but hindwings not provided with a prominent tooth or tail. Ternate females are often indistinguishable from Amboina specimens of *alphenor*.

Hab. Batjan (5 ♂, 6 ♀); Halmahera (3 ♂, 3 ♀); Ternate (4 ♂); Morty.

126. *Papilio ambrax* Boisid. [♂, ♀].

- ♂. *Papilio ambrax* Boisduval, *Voy. Astrolabe, Ent.* p. 40. n. 5 (1832) (New Guinea); id., *Spec. Gén. Léop.* I. p. 218. n. 35 (1836) ("♀" *loc. err.*).
- ♀. *Papilio orophanes* Boisduval, *Spec. Gén. Léop.* I. p. 275. n. 98 (1836) ("Pris au pays des Papous ou aux Moluques").
- ♂ ♀. *Papilio ambrax*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 32. t. 7. f. 1 (♂). 2 (♀) (1840) (New Guinea); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 81 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 22. n. 98 (1852) (New Guinea); Blanch., *Voy. au Pôle Sud.* IV. p. 378. t. 1. f. 3. 4 (1853) (New Guinea); Gray, *List Lep. Ins. B. M. I.* p. 29. n. 103 (1856); Vollenhov., *Tijdschr. v. Ent.* III. p. 74. n. 32 (1860) (New Guinea); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 415. & p. 368. n. 245 (1864) ("Batjan." "Ternate" *loc. err.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 54. n. 67 (1865) (Mysol; Salvatty; Dorey); Oberth., *Et. d'Ent.* IV. p. 49. n. 86 (1879) (New Guinea); id., *Ann. Mus. Civ. Genova* XV. p. 473. n. 16 (1880) (Dutch & Brit. New Guinea); Snellen, *Tijdschr. v. Ent.* XXXII. p. 394 (1889) (Andai); Grose Smith, *Nor. Zool.* p. 333. n. 7 (1894) (Humboldt Bay).
- ♀. *Papilio polytes*, Kirsch, *Mith. Mus. Dresden* I. p. 112. n. 3 (1877) (Andai & Dorey); Snellen, *Tijdschr. v. Ent.* XXXII. p. 394 (1889) (Andai).

We must distinguish three geographical races of this insect:—

- (a) : *P. ambrax* Boisid. from New Guinea, Waigeu, Mysol, Salvatty;
 (b) : *P. ambrax epirus* Wall. from the Aru Islands; and
 (c) : *P. ambrax egiptius* Misk. from Queensland.

Wallace's "*P. ambracia*" is nothing but an aberration of *P. ambrax*, with which it occurs together in all places. The most variable of the three subspecies is certainly *P. ambrax*, which exhibits in either sex two forms, that are connected, however, by every intergradation; in the male sex a number of specimens have on the forewings above a subapical white patch which is absent from other specimens, and in the female there is a large white patch at the anal angle of the forewings in some individuals, while in others the wing is black. This variation is worthy of note, as the Australian form of *P. ambrax* exhibits always the white subapical patch in the male and the white anal one in the female, thus showing again, what we see in so many species of *Papilio*, that certain individual characters of a variable species become constant in certain districts.

(a) : *P. ambrax* Boisid., forma typ. [♂, ♀].

♂. The white area on the hindwings is inconstant in breadth and shape; mostly it extends in the cell about 2 mm. beyond the origin of the upper discoidal nervule, but often it stops at the base of that vein; the internervular parts of the area are

rounded exteriorly, or straightly cut off, or obliquely sinuate. Though there is never a conspicuous anal orange-red mark on the hindwings above, some specimens from German New Guinea show distinct traces of the spot, which in *P. ambrax egipius* is so well and constantly developed.

Beneath, the hindwings have mostly only one orange-red spot, standing near the anal angle; many specimens possess, however, a submarginal spot of the same red, or a whitish colour, between the lower median nervules. A *male* from Waigeu is highly interesting, as it exhibits beneath four feebly marked, but large whitish discal markings, shaped as in the *male* of *P. polytes* L., and standing between the submedian nervure and lower discoidal nervule. I propose to call this interesting (atavistic?) aberration —

(a²): ♂-ab. *conspiculus* ab. nov.

In many specimens of *ambrax*, especially in individuals from Waigeu, these spots are indicated by a few white scales.

♀. *Upperside*: the white area of the hindwings consists usually of six (five extra- and one intracellular) spots in all, which are seldom separated from one another, as the veins themselves are nearly always completely covered with white scales. The intracellular spot is sometimes very much reduced; the extracellular white markings are occasionally also very small, and are often partly replaced by red ones; that between the discoidal nervules is not seldom absent. In a few examples the white area is connected with the costal margin by means of two additional white markings (compare ♀ of *P. polytes* L., p. 348). The red colour behind the posterior part of the white area extends mostly from the submedian vein beyond the second median nervule; sometimes it reaches the upper median nervule, while in other individuals it scarcely reaches the second median branch; the nervules traversing the red patch are seldom white. There are from one to three submarginal red spots, besides a red marginal mark between the lower median and the submedian veins which is mostly joined to the large subanal red spot in the same cellule. A specimen from Redscar Bay, British New Guinea, has five submarginal spots, and leads over to *P. ambrax egipius* Misk. from Queensland.

Underside: as above; the series of submarginal spots of the hindwings is, however, mostly complete; sometimes the two spots between the subcostal and second discoidal veins are wanting.

Boisduval attributes to his *P. orophanes* a series of marginal (*recte* submarginal) lunules on the upperside of the hindwings, of which the exterior (*recte* anterior) ones are very little marked. I am not quite convinced that *orophanes* is the *female* of the present race of *P. ambrax*, but believe that it belongs to *P. ambrax epirus* Wall.; as the description is, however, not sufficient to solve the question, and the type apparently is lost, it is best to treat *orophanes* as a synonym of *ambrax*.

(b²): ab. *ambracius* Wall.

♂ ♀. *Papilio ambracia* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 54. n. 68 (1865) (Waigeu); *Butl., Ann. Mag. N. H.* (4). XVIII. p. 248. n. 30 (1877) (Pt. Moresby).

♂ with white patch at the apex of the forewings.

♀ with white patch in the anal region of the forewings.

Occurs together with *P. ambrax* in all localities.

Hab. New Guinea: Dutch New Guinea (25 ♂, 20 ♀), German New Guinea

(11 ♂, 4 ♀), British New Guinea (Redscar Bay, 3 ♂, 1 ♀): Waigeu (8 ♂, 6 ♀); Mysol; Salvatty; D'Entrecasteaux Islands (a short series).

(b): *P. ambrax epirus* Wall. [♂].

♂. *Papilio epirus* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 54. n. 69 (1865) (Aru Is.).

♂ ♀. *Papilio ambrax* var. *epirus*. Ribbe, *Iris* I. p. 78. n. 5 (1886) (Aru Is.).

♂. Differs from *P. ambrax* Boisd. in the hindwings being provided above with an orange-red anal lunule, and below with a series of from four to seven submarginal spots, besides the anal mark. The white area on the hindwings is shaped as in certain *P. ambrax*; the posterior ones of the white spots are exteriorly rounded.

♀. Undescribed and unknown to me. Wallace, *l.c.*, referred the *female* figured by Blanchard in *Voyage au Pôle Sud*. IV. t. 1. f. 3. 4 to *epirus*; I do not see that Blanchard's figure, said to be taken from a New Guinea specimen, disagrees with New Guinea examples. Ribbe has found both sexes, as far as I could ascertain, but where his specimens now are I do not know.

Hab. Aru (and Key ?) Islands.

(c): *P. ambrax egipius* Misk. [♂, ♀].

Papilio egipius Miskin, *Tr. Ent. Soc. Lond.* p. 451 (1876) (Roekingham Bay); Olliff, *Proc. Linn. N.S. Wales* p. 395 (1888) (Mt. Belender-Ker, Queensland).

♂. Forewings with a white apical patch. Hindwings above with an anal orange-red spot, and below with a series of submarginal spots varying in number from four to seven. The white area of the hindwings often does not extend beyond the lower median nervule.

♀. Forewings with a white patch in the anal region. Hindwings with a complete series of submarginal spots above and below. The orange-red colour of the upperside behind the white discal area is more restricted than in *P. ambrax* Boisd.

Hab. Queensland (12 ♂, 13 ♀).

127. *Papilio phestus* Guér. [♂, ♀, pupa].

♂. *Papilio phestus* Guérin, *Voy. Coquille, Atlas. Ins.* t. 14. f. 2. A. B. (1829); Boisd., *Voy. Astrol., Lep.* p. 41 (1832) (*patria?*); id., *Spec. Gén. Lép.* I. p. 212. n. 27 (1836) (*patr. dub.*); Guérin, *l.c.*, *Zool.* III. p. 274 (1842?) ("New Guinea" *ex err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 73 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 21. n. 94 (1852); id., *List Lep. Ins. B. M.* I. p. 28. n. 101 (1856); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 414 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 50 (1865).

♂. *Papilio parkinsoni* Honrath, *Berl. Ent. Zeit.* XXX. p. 129. t. 5. f. 1 (1886) (New Britain).

Though this species is said by Guérin to be found in New Guinea, I do not believe that it occurs there; it is quite probable that the type-specimen was found on one of the islands of the Bismarck Archipelago, which have also been visited by the *Coquille*, and that this is only one of the numerous errors of locality which we so often find in the material collected on "Voyages round the World."

According to the figure and the type-specimen in the collection of Mr. H. W. Adams, *P. parkinsoni* Honr. is the same as *P. phestus* Guér. Honrath compares *P. parkinsoni* with *P. ambrax* Boisd., and does not mention *P. phestus* Guér.

The specimens from the different islands do not show any localised variation which might induce me to separate the species into local forms; they are so variable in every locality both in size and pattern that I cannot find a single character which appears more often in one island than in another.

♂. The white area of the hindwings, on the upperside, enters the cell or not; it consists of seven clearly marked spots, while in *P. ambrax* there are mostly only six, the posterior one being absent, or at least obsolete. Most specimens have two red marks in the anal region; sometimes there is also a red discal mark in front of the lower median nervule. On the underside the number of the discal white spots (corresponding to those of *P. polytes* L.) varies from six to two; in the latter case the spots are ill defined, and there may occur specimens which have no white spots at all; the submarginal red markings vary from seven to four; some specimens have an additional, discal, red spot as on the upperside; very often there are, in both sexes, discal rays of blue scales; a few blue scales are always met with, whereas in *P. ambrax* they are entirely wanting, as in the Moluccan races of *P. polytes* L.

♀. The forewings resemble sometimes those of *P. ambrax egiptius* Misk. in being almost pure white in the posterior region of the disc. The hindwings are very variable in pattern; the cellular white spots are large, small, or absent; the discal white spots vary from three to five; the submarginal row consists of three or four red spots; in my specimens the underside has four to seven submarginal markings, and rather well-marked discal rays of blue scales. White discal spots as above.

(a²): ab. *minor* Honr.

Papilio parkinsoni var. *minor* Honrath, *l.c.* p. 130. t. 5. f. 2 (♂). 2a (♀) (1886) (New Britain).

This aberration is based on small specimens.

The pupa of *P. phestus* Guér. is similar in general form to that of *P. polytes* L., but the two projecting points of the head are longer and more acute, and the abdomen bears at the base and behind a pair each of very large foliated protuberances, and on the middle segments a pair of small processi.

Hab. New Britain (4 ♂, 1 ♀); New Ireland (8 ♂); Solomon Islands (10 ♂, 5 ♀).

Inhabits probably all the islands of the Bismarck Archipelago and of the Solomon group.

128. *Papilio dunali* Montrouz.

♂. *Papilio dunali* Montrouzier, *Ann. Soc. Ph. Nat. Lyon* p. 396 (1856) (Woodlark I.); id., *Essai s. l. Faune d. Woodl.* (Separ.) p. 118 (1857); Butl., *P. Z. S.* p. 289. n. 91 (1874).

This insect seems to be more closely allied to *P. phestus* Guér. than to *P. ambrax* Boisd., as the hindwings have on the underside "deux taches roses près du bord anal, et quatre taches blanches par derrière, dont deux touchent le bord, et les autres rentrent plus en dedans."

Hab. Woodlark Island.

XIX. CASTOR-GROUP.

Basal partition of the subcostal vein of the hindwings somewhat longer than the upper discocellular nervule.

129. *Papilio castor* Westw. [♂, ♀].

♂. *Papilio castor* Westwood, *Ann. Mag. N. H.* IX. p. 37 (1842) (Sylhet); id., *Proc. Ent.* II. p. 129. t. 80. f. 2. 2* (1845); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 12. n. 72 (1846); Westw., *P. Z. S.* p. 479. t. 44. f. 1-3 (1881).

♀. *Papilio pollux* Westwood, *Ann. Mag. N. H.* IX. p. 37 (1842) (Sylhet); id., *Proc. Ent.* II. p. 129. t. 80. f. 1 (1845); Doubl. Westw. & Hew., *l.c.* I. p. 21. n. 264 (1852); Westw., *P. Z. S.* p. 479. t. 44. f. 4 (1881).

- ♂ ♀. *Papilio castor*, Gray, *Cat. Lep. Ins. B. M.* I. p. 21. n. 93 (1852); id., *List Lep. Ins. B. M.* I. p. 28. n. 100 (1856); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 93. n. 188 (1857) (Cherra Punji; Sylhet); Semper, *Wien. Ent. Mon.* VII. p. 281. t. 19 (1863) (gynandromorphic specimen!); Feld., *Verh. z. b. Ges. Wien* p. 320. n. 413. & p. 367. n. 244 (1861) (Sylhet; Darjeeling); Oberth., *Et. d'Ent.* IV. p. 49. & p. 114. n. 85 (1879) (Sylhet; Sikkim); Elwes, *Tr. Ent. Soc. Lond.* p. 437. n. 436 (1888) (Sikkim; not uncommon up to 2000 or 3000 feet); Robbe, *Ann. Sor. E. Belg.* p. 124. n. 7 (1892) (Darjeeling; Kurseong); Haase, *Unters. iib. Mim.* p. 46 (1893); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin; ♂ with a series of seven spots on hindwings; perhaps an ab. of *mehala* Grose Smith?).
- ♂ ♀. *Papilio (Chlorus) castor*, Wood-Mas. & Nicé., *Journ. As. Soc. Beng.* p. 375. n. 180 (1886) (Cachar).
- ♂ ♀. *Tamera castor*, Moore, *New Ind. Lep. Ins.* p. 284 (1888) (descr. of "genus" *Tamera*); Swinh., *Tr. Ent. Soc. Lond.* p. 315. n. 406 (1893) (Khasia Hills).
- ♂ ♀. *Papilio (Tamera) castor*, Nicéville, *Gazetteer of Sikkim* p. 172. n. 480 (1894) (Sikkim, 1000 to 3000 feet, from April to October; less common than *chaoui*).

(a): **P. castor** Westw., forma typ. [♂, ♀].

The upper median nervule of the hindwings is in the *male* always, in the *female* sometimes, produced into a more or less prominent tooth. In size the *male* is apparently much more variable than the other sex; the "winter" specimens are the smallest.

Though it has not yet been proved by rearing that *P. castor* Westw. and *P. pollux* Westw. are *male* and *female* of the same species, there can be no doubt that it really is so. The differences between *castor* and *pollux*, if one compares a larger series of specimens, gradually disappear, or nearly so: the patch of the hindwings of *castor* becomes narrower and longer, and the dirty whitish colour of *pollux* is more and more concentrated to the middle of the wing, and forms a grey macular band across the disc; when finally the posterior spots of that band disappear, there remains in the *female* a series of five spots, which are almost shaped as in the extreme form of the *male*.

The submarginal spots of the forewings of the *female* vary very much in number and size. In my *female* specimens from Sikkim the whitish colour on the hindwings extends down to the base of the wing, and the greatest part of the discoidal cell above and below is occupied by that colour; in the Assam specimens the basal half, including the whole of the cell, assumes gradually a uniform brown colour, so that the hindwings have a well-defined discal band, which is sometimes of as pure a creamy white colour as in the *male* sex.

Hab. Assam (7 ♂, 8 ♀); Sikkim (5 ♂, 8 ♀).

(b): **P. castor mehala** Grose Smith [♂, ♀].

- ♂ ♀. *Papilio mehala* Grose Smith, *Ann. Mag. N. H.* (5). XVIII. p. 150 (1886) (Tungu, Burma); id. & Kirby, *Rhop. Exot.* I. *Pap.* t. 2. f. 1 (♂). 2 (♀) (1888).
- (?). ♂. *Papilio castor*, Oberthür, *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin).

I enumerate this form of *castor* as a subspecies, though it may turn out to be a mere aberration. At present there are, however, only a very few specimens known which must be referred to *mehala*; and considering that *castor* inhabits the lower parts of Sikkim, Assam, Cachar, and *P. mahadeva* Moore the mountainous districts of Burma, the Siamese Shan States, and Upper Tenasserim, it is quite probable that *mehala* is confined to the lower parts of Burma, and very likely also to the lower districts of Siam and Tonkin; the *P. castor* which Oberthür (*l.c.*) records from Tonkin seems indeed, at least partly, to belong to *mehala*.

The *male* as described and figured by Mr. H. Grose Smith has a discal series of seven spots on the hindwings, of which the two posterior ones are very small and of

a yellowish colour; in a *male* from Burma, in my own collection, the two posterior spots are wanting, and the specimen approaches thus certain *males* of *castor* very much.

The *female* of Mr. Grose Smith has on the forewings a complete series of submarginal spots, of which the anterior ones are enlarged; and on the hindwings it has a discal series of spots of the same size as they are found in certain *females* of *castor* from Assam. A Burmese *female* in my collection has only a few small submarginal spots on the forewings in the anal region, and the discal macular band of the hindwings consists only of six spots, of which the first, fifth, and sixth are very small.

The *male* and *female* in my collection here referred to are doubtless *mehala*, as they were obtained in Burma, and prove that the large submarginal spots of the forewings in the type-specimen of the *female* sex are merely due to individual aberration. To a certain degree *mehala* stands intermediate between *castor* and *mahadeva*, but the complete series of intergraduates between *castor* and *mahadeva* being still wanting, *mahadeva* must stand as a distinct species.

Hab. Burma (1 ♂, 1 ♀); (?) Tonkin.

130. *Papilio mahadeva* Moore [♂, ♀].

♂. *Papilio mahadeva* Moore, *P. Z. S.* p. 840. t. 51. f. 1 (♂) (1878) (Upper Tenasserim: Moolai to Moolat, 4500 feet; *nee* ♀); Wood-Mas., *Journ. As. Soc. Beng.* p. 144 (1880).

♂ ♀. *Papilio (Chorus) mahadeva*, Elwes & Nicéy., *Journ. As. Soc. Beng.* p. 437. n. 137 (1886) (Tavoy & Siam; both sexes).

Sexes almost the same, but the *female* paler brown than the *male*.

The spots of the discal macular band of the hindwings are short, and all nearly of the same size.

The *female* specimen from Eastern Bengal, which Moore (*l.c.*) supposed to be the *female* of *mahadeva*, is most probably a *female* of *P. castor mehala*, or belongs to *P. castor* itself.

Hab. Upper Tenasserim (2 ♂); Upper Burma (5 ♂); Siamese Shan States (2 ♂, 1 ♀).

131. *Papilio dravidarum* Wood-Mas. [♂, ♀].

♂ ♀. *Papilio dravidarum* Wood-Mason, *Journ. As. Soc. Beng.* p. 144. t. 8. f. 1 (♂) (1880) (Mysore; Trevandrum).

Papilio abrisa Kirby, *Proc. Roy. Dubl. Soc.* (2). XI. p. 338 (1880).

♂ ♀. *Papilio pollux* var. *dravidarum*, Westwood, *P. Z. S.* p. 482. t. 45. f. 1 (♂). 2 (♀) (1881).

♂ ♀. *Papilio (Chilusa) dravidarum*, Hampson, *Journ. As. Soc. Beng.* p. 363 (1888) (Nilgiris; common in the western slopes); Fergus., *Journ. Bombay N. H. Soc.* p. 446. n. 182 (1891) (Travancore; fairly common in the low country).

Differs from *P. mahadeva* in the forewings being provided with a complete series of submarginal spots.

Hab. South India (8 ♂).

Specimens intermediate between this species and *castor* are unknown, but may occur in the districts interjacent between the areas inhabited respectively by *castor* and *dravidarum*.

XX. AGESTOR-GROUP.

Basal partition of the subcosta to the hindwings at least twice as long as the upper discocellular vein.

132. *Papilio agestor* Gray [♂, ♀].

- Papilio agestor* Gray, *Zool. Misc.* p. 32 (1832) ("Sumatra" *loc. err.*); Boisdu, *Spec. Gén. Léop.* I. p. 376. n. 223 (1836); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 21. n. 262 (1846) (Nepaul; Assam); Gray, *Lep. Ins. Nepaul* p. 6. t. 4. f. 2 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 71. n. 325 (1852) (N. India); id., *List Lep. Ins. B. M.* I. p. 82. n. 340 (1856) (N. India; Nepaul, 1 ♀ presented by M.-Gen. Hardwicke!); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 91. n. 186 (1857) (N. India; Darjeeling); Feld., *Verh. z. h. Ges. Wien* p. 308. n. 278 (1864) (*p.p.*); Moore, *P. Z. S.* p. 756 (1865); Oberth., *Et. d'Ent.* IV. p. 100. n. 318 (1879); Stauding. & Schatz, *Érot. Schou.* I. p. 6 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 431. n. 422 (1888) (*synon. p.p.*); Sikkim: rare, 6000 to 7000 feet, and at lower elevations); Haase, *Untersuch. üb. Mim.* p. 48. t. 7. f. 47 (1893).
- Cadugoides agestor*, Moore, *P. Z. S.* p. 260 (1882) (Descr. of "genus" *Cadugoides*); Swinh., *Tr. Ent. Soc. Lond.* p. 315. n. 407 (1893) (Khasia Hills).
- Papilio (Cadugoides) agestor*, Nicéville, *Gazetteer of Sikkim* p. 174. n. 490 (1894) (Sikkim: single-brooded, rather rare, March to May, 5000 to 7000 feet).

This species has three well distinguishable geographical forms; one inhabits North-West India, including Cashmere, a second Western China, and a third North India; a fourth race, which is, however, scarcely worth being treated as such, flies in the Malay Peninsula and North-West Siam. These forms run into one another, and specimens from interjacent districts can just as well be treated as belonging to the one as to the other subspecies respectively.

Gray described the species from General Hardwicke's collection; the description is so short that it applies to both the North and North-West Indian races. In 1846 he published a figure taken from General Hardwicke's collection of *drawings*, and gave to it, as in the first description in 1832, the erroneous habitat Sumatra. In his *List. etc. (l.c.)* Gray enumerates a specimen of *agestor* from Nepaul, presented by Major-Gen. Hardwicke; this specimen cannot be regarded as the actual type of the species, the species being described from a drawing, not from a specimen. Now Gray's figure does not fit the Assam and Sikkim *Papilio* usually understood to be *agestor* Gray, and there arises the question, which is the true *agestor* Gray? *i.e.* to which local race has the name of *agestor* to be restricted? As Gray's descriptions of *agestor* are too incomplete to be of any value in solving that question, we must rely entirely upon his figure. In the hindwings bearing a complete series of small grey spots midway between cell and outer margin, and being shaded with blackish brown outside these spots, especially anteriorly, and in having a long grey streak along the abdominal margin, the figure agrees exactly with certain *females* of Mr. F. Moore's *P. govindra* from the North-West Himalayas. The outline of the hindwings is the same as in Sikkim and Assam specimens, which have the wings much more angulate than the North-West Indian examples; I must add that in one of my Cashmere specimens the hindwings are, however, formed as in those from Assam. As the *females* of all races of the present *Papilio* have the hindwings more rounded than the *males*, Hardwicke's drawing was evidently taken from a *male* with a pattern similar to that of the *females* of the North-West Indian *govindra*.

Such *males*, which in fact stand intermediate between the Sikkim and Assam *agestor* on the one hand and *govindra* on the other, occur, however, in Nepaul, and are there the usual form, as far as I could ascertain. The fact that General Hardwicke's collection was especially rich in Nepaul insects, and that, to my knowledge, derived from the various articles published about insects of Hardwicke's collection, he had only a few or scarcely any from the eastern parts of North India, can but strengthen my opinion. If I am right in my surmise that Gray's type was a *male* from Nepaul, it was also most probably from the more eastern districts of that province, considering

colour and shape of the hindwings; and it will be much better to unite the Assam, Sikkim, and Eastern Nepal *Papilio* under the name of *agestor* Gray, and to treat the *Papilio* from Western Nepal and Cashmere as a second Indian subspecies, than to split up the species into three North Indian local races, besides the Chinese race. We must, however, keep in mind that the Assam and Sikkim *agestor* is not *typical*, and that the true *agestor* approaches to a certain extent *P. agestor govindra* Moore. Larva and chrysalis are unknown.

(a): **P. agestor** Gray, forma typ. [σ , φ].

Some *males* from the Burmese frontier of Siam and a *female* from Perak are slightly different from Assam and Sikkim examples. The black bar crossing the apex of the cell on the upperside of the forewings, and the longitudinal streak within the cell behind the costal margin of the same wing below, are broader; the ochreous tawny lines (two) in the cell of the hindwings are short on both sides, especially in the φ . The apex of the forewings below is much darker brown.

I think it is better not to name this form, as most probably a more distinct race will be found in Sumatra or Lower Siam, to which these Perak and Upper Siam specimens lead over.

Hab. East Nepal; Sikkim (15 σ , 1 φ); Assam (12 σ , 2 φ); Burma (4 σ); Shan States (4 σ); Perak (W. Doherty, January to February 1890) (1 φ).

(b): **P. agestor govindra** Moore [σ , φ].

Papilio agestor, Westwood, *Arc. Ent.* I. p. 59. t. 16. f. 2 (φ) (1848) ("India"); Kollar, *Hügel's Reise n. Kaschmir* IV. 2. p. 406. t. 3. f. 1. 2 (1848) (Mussuree); Hutton, *Tr. Ent. Soc. Lond.* V. p. 50. n. 11 (1847) (Mussuree); Feld, *Verh. z. b. Ges. Wien* p. 308. n. 278 (1864) (*p.p.*); Elwes, *Tr. Ent. Soc. Lond.* p. 431. sub n. 422 (1888).
 σ . *Papilio govindra* Moore, *Ent. Mo. Mag.* I. p. 101. note (1864); id., *P. Z. S.* p. 486. n. 2 (1865); Butler, *Ann. Mag. N. H.* (6). I. p. 206 (1888) (N.W. India).
 φ . *Calugoides govinda* Moore, *l.c.* p. 260 (1882).
 σ . *Calugoides govindra* Moore, *P. Z. S.* p. 261 (1882).

Smaller than *agestor* Gray. Hindwings blackish towards the outer margin, especially anteriorly, more so in the σ than in the φ ; disc with a complete series of grey spots; this series is evidently always incomplete in *agestor*.

Hab. North-West India and Cashmere [8 σ , 3 φ].

(c): **P. agestor restrictus** Leech [σ , φ].

σ φ . *Papilio agestor* var. *restricta* Leech, *Bull. from China*, etc. p. 557. t. 35. f. 5 (φ) (1893) (Chang-Yang, China).

Of the size of *P. agestor* Gray. Veins of the forewings more heavily bordered with black. Hindwings black, with a large, triangular, bright reddish brown patch in the anal region.

Hab. China: Chang-Yang (coll. Leech), Ichang (Mus. Rothschild, 1 σ).

133. **Papilio epycides** Hew. [σ , φ].

σ . *Papilio epycides* Hewitson, *Ecot. Bull.* III. *Pap.* t. 6. f. 16 (σ) (1864) (N. India); Feld, *Verh. z. b. Ges. Wien* p. 308. n. 279 (1864); Moore, *P. Z. S.* p. 756 (1865); Oberth., *El. d'Ent.* IV. p. 100. n. 319 (1879) (Darjeeling).

σ φ . *Papilio epycides*, Elwes, *Tr. Ent. Soc. Lond.* p. 432. n. 423 (1888) (Sikkim: first descr. of φ ; Sikkim; not uncommonly in some seasons at 2000 to 3000 feet, in April and May).

Calugoides epycides, Swinhoe, *Tr. Ent. Soc. Lond.* p. 315. n. 498 (1893) (Khasia Hills).

Papilio (Menumopsis) epycides, Nicéville, *Gazetteer of Sikkim* p. 173. n. 184 (1894) (Sikkim; single-brooded, at low elevations, April and May).

(a) : *P. epycides* Hew., forma typ. [♂.♀].

The *female* has the markings of the wings larger than the *male*, and mostly of a much paler colour; the submarginal spots of the hindwings are especially enlarged. The forewings have often some minute linear spots between the outer margin and the submarginal series of rounded markings in both sexes. The anal yellow mark is slightly variable in size.

Hab. Sikkim (18 ♂, 1 ♀); Assam (8 ♂, 7 ♀).

(b) : *P. epycides horatius* Blanch. [♂].

♂. *Papilio horatius* Blanchard, *Compt. Rend.* vol. 72, p. 809, note 2 (1871) (W. China).

♂♀. *Papilio epycides* var. *horatius*, Leech, *Bull. from China*, etc. p. 555 (1893) (W. China).

The whitish markings of the outer region of the wings below are more restricted, partly obliterated, and all the pale markings much clouded with black.

Hab. Western China (1 ♂).

134. *Papilio slateri* Hew. [♂,♀].

(?) *Papilio slateri* Gray, *List Lep. Ins. B. M. I.* p. 85, n. 354 (1856) (Patria?; *nom. nud.*!).

Papilio slateri Hewitson, *Exot. Butt.* II. *Pap.* t. 4, text (*nee* fig.) (1859) (*p.p.*; "Borneo" *loc. err.*);

Feld., *Verh. z. b. Ges. Wien* p. 308, n. 277 (1864) (*p.p.*); Westw., *Proc. Ent. Soc. Lond.* (3).

II. p. 14 (1864) (Sylhet); Moore, *P. Z. S.* p. 756 (1865); Oberth., *Et. d'Ent.* IV. p. 100, n. 315 (1879) (Darjeeling); Standing, & Schatz, *Exot. Schmett.* I. p. 6 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 429, n. 415 (1888) (*first descr. of ♀*; Sikkim, very rare, outer hills at a very low elevation); Haase, *Untersuch. ih. Mim.* p. 47 (1893) ("Java" *loc. err.*).

Isamiopsis slateri, Swinhoe, *Tr. Ent. Soc. Lond.* p. 314, n. 404 (1893) (Khasia Hills).

Papilio (Menamopsis) slateri, Nicéville, *Gazetteer of Sikkim* p. 173, n. 483 (1894) (Sikkim; single-brooded, April and May, low outer valleys only; common at Sivoke).

This *Papilio* inhabits Sikkim, Assam, Burma, Tonkin, Tenasserim, Sumatra, and Borneo in four subspecies, which gradually run into one another.

(a) : *P. slateri* Hew. occurs in Northern India;

(b) : *P. slateri taroyanus* Butl. in Tenasserim, Upper Burma, the Shan States, and Upper Tonkin;

(c) : *P. slateri perses* Nicév. in Sumatra; and

(d) : *P. slateri hewitsoni* Westw. in Borneo.

The pale bluish streaks of the forewings are long and exteriorly sharply cut off in *P. slateri*; in typical *taroyanus* these streaks are represented by some small indistinct spots and patches; in intermediate examples the spots become larger, better defined, and assume the form of the streaks of *slateri*. In the Sumatran race (*perses* Nicév.) the forewings have no blue, but in an aberration described by De Nicéville as *P. petra* the streaks of *slateri* reappear, but are white, not bluish; the exterior region of the forewing of *perses* and its aberration is of a lighter brown colour than the base, just as is the case in *P. slateri taroyanus*, whereas in *P. slateri hewitsoni* the forewings are of a uniform brownish black colour.

In the shape of the forewings there is considerable variation; *hewitsoni* has the most rounded outer margin; in *slateri* that margin is sometimes as convex as in *hewitsoni*, but often it is rather strongly concave.

The hindwings are above of almost uniform colour in typical *P. slateri* and *hewitsoni*; in *taroyanus* and *perses* they have a submarginal white band, which consists of conical markings standing in pairs between the nervules. Now in *slateri* these markings are sometimes slightly indicated; in other specimens they are clearly visible, but much shaded with brown, and in a *female* from the Khasia Hills they are

of as pure a white colour as in *tavoyanus*. In a Kina Batu example of *hewitsoni* these spots, though feeble, are also visible. Thus I cannot see how to draw a distinct parting line between *slateri*, *tavoyanus*, *perses*, and *hewitsoni*, and must accordingly treat these insects as subspecies of the same species.

(a): **P. slateri** Hew., forma typ. [♂, ♀].

The bluish streaks of the forewings are above sometimes of a violet colour; below they are always very faint. The submarginal white spots of the hindwings are, on the underside, always more or less marked, but faint, seldom as large as in *tavoyanus*. *Female* a little larger than the *male*, otherwise scarcely different.

Hab. Assam (6 ♂, 1 ♀); Sikkim (15 ♂, 2 ♀).

(b): **P. slateri tavoyanus** Butl. [♂].

♂. *Papilio tavoyanus* Butler, *Ann. Mag. N. H.* (5). X. p. 373. n. 3 (1882, November) (Tenasserim).

♀. *Papilio clarac* Marshall, *Journ. As. Soc. Beng.* p. 42. n. 7. t. f. 5 (♂) (1882, December) (Upp. Tenasserim).

♂. *Papilio* (*Menamopsis* subg. nov., Nicév.) *tavoyanus*, Elwes & Nicév., *Journ. As. Soc. Beng.* p. 433. n. 123 (1886) (Ponsekai; "*Menamopsis*" nom. nud.!).

♂. *Papilio slateri* forma geogr. *marginata* Oberthür, *Et. d'Ent.* XVII. p. 3. t. 4. f. 35 (♂) (1893) (Tonkin).

Oberthür's *marginata* stands in the markings of the forewings intermediate between typical *slateri* and typical *tavoyanus*; specimens from the Siamese Shan States in my collection agree with Oberthür's figure, others from the same locality are typical *tavoyanus*; *marginata* is, therefore, not a geographical form, and is best treated as a synonym.

The *female* is still unknown.

Hab. Tenasserim (2 ♂); Shan States (5 ♂); Upper Tonkin.

(c): **P. slateri perses** Nicév. [♂].

♂. *Papilio* (*Menamopsis*) *perses* Nicéville, *Journ. As. Soc. Beng.* p. 46. n. 40. t. 4. f. 7 (♂) (1894, May) (N.E. Sumatra).

♂. *Papilio hewitsonii* var. *sumatrana* Hagen, *Iris* VII. p. 20 (1894, July) (Sumatra).

Resembles *P. slateri hewitsoni* Westw., but has a row of white submarginal spots to the hindwings.

(a²): ab. *petra* Nicév.

Papilio (*Menamopsis*) *petra* Nicéville, *l.c.* p. 47. n. 41. t. 4. f. 5 (♂) (1894) (N.E. Sumatra).

This insect has been discovered in the same district where *perses* was obtained, and it is most probably nothing but an atavistic example of the latter, provided it has the same structural characters as *P. slateri*. I have not had the opportunity to examine a specimen of this aberration.

Hab. North-Eastern Sumatra.

(d): **P. slateri hewitsoni** Westw. [♂].

(?) *Papilio camma* Gray, *List Lep. Ins. B. M. I.* p. 85. n. 355 (1856) (Borneo; nom. nud.!).

♂. *Papilio slateri* ♀ Hewitson, *Exot. Butt.* II. *Pap.* t. 4. f. 9 (text *p.p.*) (1859) (Borneo); *Feld. Verh. z. b. Ges. Wien* p. 308. n. 277 (1864) (*p.p.*).

♂. *Papilio hewitsonii* Westwood, *Proc. Ent. Soc. Lond.* (3). 2. p. 10 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 61. n. 86 (1865) (Borneo); Standing & Schatz, *Exot. Schmett.* I. p. 6 (1864); Nicév., *Journ. As. Soc. Beng.* p. 46. sub n. 40 (1894).

The bluish spots of the forewings have disappeared.

The *female* is unknown.

Hab. Borneo (1 ♂).

135. *Papilio laglaizei* Depuiset [♂, ♀, pupa?].

- ♀. *Papilio laglaizei* Depuiset, *Bull. Soc. Ent. France* p. 171 (1877) (New Guinea); id., *Ann. Soc. Ent. France* p. 141. t. 5 (1878) (Amberbaki); Oberth., *Et. d'Ent.* IV. p. 60. n. 152 (1879) (Amberbaki); Lucas, *Bull. Soc. Ent. France* p. 128 (1881) (pupa; this species?); Haase, *Untersuch. üb. Mim.* p. 45 (1893).
- ♂. *Papilio albidinus* Butler, *Ann. Mag. N. H.* (5). XI. p. 423. n. 81 (1883) (Aru Is.); Röber, *Iris* I. p. 30. t. 1. f. 1 (♂) (1885) (Aru Is.).
- ♂ ♀. *Papilio albidinus*, Ribbe, *Iris* I. p. 78. n. 14 (1886) (Aru Is.: 1 ♂, 1 ♀); Haase, *Untersuch. üb. Mim.* p. 45 (1893).

Besides the figures of *P. laglaizei* ♀, *albidinus* ♂, I have compared 2 ♂ and 1 ♀ from German New Guinea, 3 ♂ and 2 ♀ from Waigen, and 1 ♂ from the Aru Islands, and I am convinced that *P. laglaizei* Depuiset and *P. albidinus* Butler are the same species and cannot be kept separate even as local races. In the specimens which I have examined, the shape of the wings, the form and position of the bands, and the size of the spots are so variable, independently of locality, that I cannot find a single character by which the Aru individuals are distinguishable from those from Waigen or New Guinea; indeed, scarcely two of the above eleven individuals are alike.

The best place in the system for this peculiar mimetic species is in the neighbourhood of *Papilio slateri* Hew., *epycides* Hew., and *agestor* Gray, with which *P. laglaizei* Depuiset has in common the short antennae, the peculiar form of the cell of the hindwings, and the position of the subcostal nervule of the hindwings, this vein branching off at the apical third of the cell in all these species.

Hab. Dutch New Guinea; German New Guinea (1 ♂); Waigen (2 ♂, 2 ♀); Aru Islands.

XXI. CLYTIA-GROUP.

Basal partition of the subcostal vein of the hindwings shorter than the upper discocellular nervule.

136. *Papilio clytia* L. [♂, ♀, metam.].

- Papilio Nymphalis Phaleratus clytia* Linné, *Syst. Nat.* ed. x. p. 479. n. 125 (1758) (India); id., *Mus. Lul. Uv.* p. 296. n. 114 (1764) (India); id., *Syst. Nat.* ed. xii. p. 781. n. 189 (1767) (India); Bouitt., *Naturh. Hist.* I. II. p. 332. n. 125 (1767); Müll., *Naturs.* V. I. p. 611. n. 189 (1774); Fabr., *Syst. Ent.* p. 507. n. 270 (1775) (India); Goeze, *Ent. Beytr.* III. I. p. 331. n. 189 (1779); Fabr., *Spec. Ins.* II. p. 95. n. 415 (1782); id., *Mat. Ins.* II. p. 50. n. 500 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2324. n. 189 (1790); Fabr., *Ent. Syst.* III. I. p. 127. n. 387 (1793).
- Papilio Epues Achirus panope*, Esper, *Aust. Schmett.* p. 232. n. 108. t. 57. f. 2 (1798).
- Princeps Domineus panope*, Hübner, *Samml. Er. Schm.* I. t. 134 (1806-16).
- Arisbe panope*, Hübner, *Verz. bek. Schm.* p. 89. n. 934 (1816) (*p.p.*).
- Papilio panopes*, Godart, *Enc. Meth.* IX. p. 75. n. 142 (1819) (*p.p.*).
- Papilio dissimilis*, Doubt. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 21. n. 263 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 71. n. 330 (1852) (*p.p.*); id., *List Lep. Ins. B. M.* I. p. 84. n. 348 (1856) (*p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. L. L. C.* I. p. 91. n. 87 (*p.p.*) (1857); Vollenhov., *Tijdschr. v. Ent.* III. p. 88. n. 155 (1860) (*p.p.*); Aitk. & Davids., *Journ. Bombay N. H. Soc.* p. 368. n. 76 (1890) (metamorphosis).
- Papilio panope*, Hutton, *Tr. Ent. Soc. Lond.* V. p. 49. n. 7 (1847) (Mussuri); Kollar, in Hügel, *Reise Kaschnar* IV. p. 406. n. 7 (1848) (Mussuri); Feld., *Verh. z. b. Ges. Wien* p. 309. n. 269. & p. 355. n. 156 (1864) (*p.p.*); Moore, *P. Z. S.* p. 756 (1865) (N.W. Himal.); Oberth., *Et. d'Ent.* IV. p. 101. n. 324 (1879) (*p.p.*); Elwes, *Tr. Ent. Soc. Lond.* p. 430. n. 418 (1888) (Sikkim, common); Watson, *Journ. As. Soc. Beng.* p. 268 (1890) (Madras); Betham, *Journ. Bomb. N. H. Soc.* p. 325 (1891) (Centr. Prov.); Robbe, *Ann. S. E. Belg.* p. 121. n. 3 (1892) (Kursong).
- Papilio clytia*, Aurivillius, *Konigl. Sr. Vet. Ak. Handl.* XIX. 5. p. 96. n. 114 (1882) (*syn. p.p.*); Aitken, *Journ. Bomb. N. H. Soc.* p. 37 (1887) (larva indistinguishable from that of *dissimilis*)

- Chilasa panope*, Moore, *P. Z. S.* p. 261 (1882) (N.W. Himal.) : Swinhoe, *ibid.* p. 145. n. 139 (1885) (Kurrachee) ; id., *Tr. Ent. Soc. Lond.* p. 314. n. 402 (1893) (Khasia Hills).
Papilio (Chilasa) panope, Doherty, *Journ. As. Soc. Beng.* p. 137. n. 235 (1886) (Kumaon) : Nicéy., *Gazetteer of Sikkim* p. 173. n. 486 (1894) (Sikkim, from March to November, common at lower elevations).
Papilio (Chilasa) clytia, Hampson, *Journ. As. Soc. Beng.* p. 363 (1888) (Nilgiris, 1000 to 4000 feet).

As there still exists some confusion about the identification of Linné's *Papilio clytia*, *panope*, and *dissimilis*, I here insert Linné's descriptions, which are as follows :—

- (1) *Papilio clytia* is described in *Syst. Nat.* ed. x. p. 479. n. 125 (1758) thus :—

P.N. alis dentatis nigris : margine exteriore primoribus albo maculato, posticis albo luteoque triplici ordine.

Habitat in Indiis.

In *Mus. Lud. Ulr.* p. 296. n. 114 (1764) Linné gave a fuller description of the wings :—

Alae Primores nigrae :

ad marginem exteriorem serie duplici albo-punctatae s. maculatae.

—*Posticae nigrae*, intra marginem posticum triplici serie maculatae.

Series prima Maculis albis, sagittatis.

Series secunda Maculis albis, lunatis intima lutea.

Series tertia Maculis luteis, reniformibus.

Obs. quod series tertia s. exterior a pagina superiore desit.

According to this description, the true *clytia* is that *Papilio* from Assam and Sikkim which has the upper surface of the wings almost black, the forewings provided with a marginal and a submarginal series of white spots, and the hindwings with three rows of spots, of which the interior ones are sagittate, the submarginal lunate, and the marginal ones reniform and yellowish buff.

- (2) *Papilio panope* is described in *Syst. Nat.* ed. x. p. 479. n. 131 (1758) thus :—

P.N. alis dentatis fuscis concoloribus : limbo exteriore albo maculatis : posticis margine luteo maculatis.

Habitat in Asia.

Alae primores ad marginem exteriorem maculis obsoletioribus albis sagittatis. Posticae intra marginem posteriorem ordine triplici macularum sagittiformium, quarum postremae reniformes luteae.

In *Mus. Lud. Ulr.* this insect is not redescribed.

The description of *panope* differs from that of *P. clytia* chiefly in two points : the wings of *panope* are described as being fuscous, not black, and the forewings are said to have, at the exterior margin, more or less obsolete sagittate maculae, not two series of spots. These two characters are met with in many examples of *Papilio oupape* Moore, which inhabits Tenasserim, Malacca, Siam, Cochin China, South-East China, Hainan, and Formosa. Cramer, *Pap. Ecot.* IV. p. 13. t. 295. f. E. F (1782) figured this more eastern insect as *panope* L., and there is no reason to abandon his identification.

- (3) *Papilio dissimilis* is described in *Syst. Nat.* ed. x. p. 479. n. 131 (1758) thus :—

P.N. alis dentatis dilatato-venosis nigris concoloribus : maculis sagittatis albis postremis subtus luteis.

Ehret pict. t. 17.*)

Habitat in Asia.

Alae omnes nigrae, quasi ex venis nigris dilatatis striatae, interjectis maculis albis sagittatis: anterioribus longioribus, postremis brevioribus: in alis posticis ordo extimus macularum reniformium luteus; ex his ad angulum uni maculae luteae geminatae, etiam supra conspicuae.

The description in *Mus. Lud. Ubr.* p. 301. n. 119 (1764) is still more complete, and there is not the slightest doubt that Linné's *dissimilis* is the insect figured under that name by Cramer, Herbst, Esper, Moore (see synonymy of *dissimilis*), which has both wings "striate" with black and white as certain Danaids.

Though the identity of Linné's three species is quite clear, there arises the question whether these insects are really different species. As *elytia* and *panope* are connected by a complete chain of intermediate specimens, *panope* must be treated as a geographical form of *elytia*, which is the first described of the two. *Papilio dissimilis* L. has a quite different aspect than either *P. elytia* or *panope*. I possess, however, specimens from the Khasia Hills which have the white markings of the forewings obliterated, except those near the outer margin, whereas the hindwings are marked as in *dissimilis*. Such specimens look as if artificially put together from *elytia* and *dissimilis*, and make it probable that *elytia* and *dissimilis* belong to one dimorphic species. We have further evidence in this direction in the observations about the life history of both insects: the caterpillars are the same, feed on the same plant, and we are told by Aitken [*Journ. Bomb. N. H. Soc.* II. p. 37 (1887)] that, out of a number of caterpillars found together, one which was not distinguishable from the rest turned into *elytia*, while the others gave *dissimilis*. Moreover *elytia* and *dissimilis* have several times been found in copula. Several Indian entomologists have tried to rear these *Papilios* from the eggs of one female, but as far as I know nobody succeeded in getting eggs from a captured specimen. Though the real proof by rearing is, therefore, still wanting, I think the evidence in favour of my opinion, that *elytia* and *dissimilis* are forms of a dimorphic species, is so strong that I am justified in treating them as such.

Besides *P. elytia*, *panope*, and *dissimilis* of Linné, eight more "species" or varieties have been erected, which are either local forms or mere individual aberrations, as explained below. I can distinguish six subspecies:—

- (a): *P. elytia* L. from Northern India;
- (b): *P. elytia lankeswara* Moore from Ceylon;
- (c): *P. elytia panope* L. from Tenasserim, Malacca, Siam, Cochin China, East China, Hainan, and Formosa;
- (d): *P. elytia panopinus* Stauding. from Palawan;
- (e): *P. elytia palephates* Westw. from the Philippine Islands; and
- (f): *P. elytia flavolimbatus* Oberth. from the Andaman Islands.

The lesser Sunda Islands are inhabited by a closely allied species, *P. echidna* Boisd.

The local races of *P. elytia* are all variable, but we have here a very curious example of incongruous variation: *P. elytia*, *P. elytia lankeswara*, and *P. elytia panope* are pronouncedly dimorphic. To each of these three geographical races belong a *elytia* and a *dissimilis* form; while, however, the *elytia*-form develops in the respective localities into a subspecies, its aberration *dissimilis*, though very variable in every locality, remains the same. The *dissimilis* from Ceylon, Assam,

Tenasserim, etc., are indistinguishable; the *elytia* from there exhibit certain obvious differences. In Palawan and the Philippines the *elytia*-form alone occurs, the *dissimilis*-form is absent. On the contrary, the Andaman Islands are inhabited by a *dissimilis*-form, whereas specimens corresponding to *elytia* are absent; and further east, in the lesser Sunda Islands, we find a species with the pattern of *dissimilis* and no *elytia*-like form. From Borneo, Sumatra, and Java no representative species of *P. elytia* L. has been recorded.

(a): *P. elytia* L., forma typ. [♂, ♀, metam.].

Specimens with a brown ground-colour occur together with almost black examples. In one Sikkim specimen the yellow marginal spots of the hindwings are very much enlarged on the upperside.

(a²): ab. *casypa* Moore.

Papilio casypa Moore, *P. Z. S.* p. 143 (1879) (Calcutta).

Papilio (Chilasa) casypa Nicéville, *Journ. As. Soc. Beng.* p. 52, n. 134 (1885) (Calcutta).

Forewings, besides the marginal and submarginal row of spots, with a third, discal series of one to five markings.

(b²): ab. *papone* Westw.

Papilio papone Westwood, *Tr. Ent. Soc. Lond.* p. 94, t. 3, f. 2 (1872) (Ind. or.).

Forewings black, with an obvious bluish tint in certain lights; the white spots absent from the forewings or faintly indicated.

(c²): ab. *conmixtus* ab. nov.

Forewings black or bluish black; with a marginal, a submarginal, and a subdiscal series of mostly feebly marked spots, and with two faint spots behind the cell and a streak along the inner margin white; the discal markings are often indicated only by a few white scales, or are entirely absent.

Hindwings with the apical half of the cell, seven long discal streaks reaching the bases of the respective cellules (the first and the last reach the base of the wing), and a marginal and a submarginal series of spots white, as in ab. *dissimilis* L.

This aberration, and examples intermediate between it and *elytia*, † received from the Khasia Hills.

(d²): ab. *dissimilis* L.*

Ehret, *Plant. ac Pap. pict.* t. 7 (1748).

Papilio Nymphalis Phalaratus dissimilis Linné, *Syst. Nat.* ed. x. p. 479, n. 130 (1758) (Asia); Clerck, *Icon. Ins.* I. t. 16, f. 2 (1759); Linné, *Mus. Lud. Utr.* p. 301, n. 119 (1764) (China); Houtt., *Naturl. Hist.* I. 11, p. 333, n. 130 (1767); Linné, *Syst. Nat.* ed. xii. p. 782, n. 195 (1767); Müll., *Naturs.* V. 1, p. 616, n. 195 (1774); Fabr., *Syst. Ent.* p. 511, n. 288 (1775); Cram., *Pap. Ex.* I. p. 129, t. 82, f. c. D (1776) (China); Sulzer, *Gesch. Ins.* p. 145, t. 18, f. 6 (1776) ("Die Mandelkrähe"; Asia); Goeze, *Ent. Beytr.* III. 1, p. 333, n. 195 (1779); Fabr., *Spéc. Ins.* II. p. 101, n. 444 (1781); id., *Mont. Ins.* I. p. 54, n. 539 (1787); Gmelin, *Syst. Nat.* I. 5, p. 2325, n. 195 (1790).

Papilio dissimilis, Jablonsky & Herbst, *Naturs. Schmetz.* VI. p. 41, n. 23, t. 126, f. 2, 3 (1793) (China); Godart, *Enc. Méth.* IX. p. 75, n. 143 (1819) (China); Lucas, *Lép. Ex.* p. 46, t. 23, f. 2 (1835) (China); Boisd., *Spéc. Gén. Lép.* I. p. 377, n. 224 (1836) (China; Bengal; Nepal); Doubl. Westw. & Hew., *Gen. Diura. Lep.* I. p. 21, n. 263 (1846) (p.p.); Hutton, *Tr. Ent. Soc. Lond.* V. p. 49, n. 6 (1847); Lucas, in Chenu's *Enc. d'Hist. Nat.* t. 14 (1851-53); Gray, *Cat. Lep. Ins. B. M.* I. p. 71, n. 330 (1852) (p.p.); id., *List Lep. Ins. B. M.* I. p. 81, n. 348 (1856)

* The bibliography of the *dissimilis*-forms of *P. elytia* L., *P. elytia lankeswara* Moore, and *P. elytia papone* L. is not kept separate.

- (*p.p.*): Horstf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 91. n. 87. (*p.p.*). t. 2. f. 3. 3a (*l.*). 3b (*p.*) (1857); Vollenh., *Tijdschr. v. Ent.* III. p. 88. n. 155 (1860) (*p.p.*): Reak., *Pr. Ent. Soc. Phil.* p. 490. n. 28 (1861) ("Philippines" *loc. cit.*); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 267. & p. 355. n. 154 (1864); Chaumette, *Ent. Mo. Mag.* p. 37 (1865) (Lucknow); Moore, *P. Z. S.* p. 486 (1865) (N.W. Himal.); Oberth., *Et. d'Ent.* IV. p. 100. n. 323 (1879) (China; Cochin China; India); Butl., *Ann. Mag. N. H.* (6). 1. p. 206 (1888) (N.W. Himal.); Watson, *Journ. As. Soc. Beng.* p. 268 (1890) (Madras); id., *Journ. Bombay N. H. Soc.* p. 54 (1891) (Chiu-Lushai).
- Papilio Eques Archicus dissimilis* Fabricius, *Ent. Syst.* III. 1. p. 38. n. 113 (1793); Esper, *Aust-Schmetz.* p. 233. t. 57. f. 3 (1798).
- Arisbe dissimilis*, Hübner, *Verz. bek. Schm.* p. 89. n. 934 (1816) (*p.p.*).
- Clytia dissimilis*, Swainson, *Zool. Illustr.* (2). t. 120 (1833).
- Papilio clytia* var. *dissimilis*, Butler, *Cat. Durn. Lep. descr. Fabric.* p. 244. sub n. 39 (1869).
- Chilasa dissimilis*, Moore, *Lep. of Ceylon I.* p. 153. t. 57. f. 1. 1a (*l.*) (1881); id., *P. Z. S.* p. 261 (1882) (N.W. Himal.); Swinhoe, *ibid.* p. 145. n. 138 (1885); id., *Tr. Ent. Soc. Lond.* p. 314. n. 401 (1893).
- Papilio clytia*, Aurivillius, *Kongl. Sc. Vet. Ak. Handl.* XIX. 5. p. 96. n. 114 (1882); Standing & Schatz, *Er. Schm.* 1. p. 6 (1884) (*p.p.*); Dist., *Rhop. Mal.* p. 353. n. 17. t. 27b. f. 2 (*♂*) (1885) (Mal. Pen.); Elwes, *Tr. Ent. Soc. Lond.* p. 430. n. 417 (1888) (Sikkim, common from the plains up to 3000 feet); Manders, *ibid.* p. 536. n. 195 (1890) (Shan States; a common species at low elevations; the dark form *panope* also occurs).
- Papilio (Chilasa) dissimilis*, Nicéville, *Journ. As. Soc. Beng.* p. 52. n. 133 (1885) (Calcutta); Doherty, *ibid.* p. 137. n. 234 (1886) (Kumaon); Hamps., *ibid.* p. 363 (1888) (Nilgiris, 1000 to 4000 feet).
- Papilio (Chilasa) clytia*, Elwes & Nicéy., *Journ. As. Soc. Beng.* p. 434. n. 127 (1886) (*P. clytia* and *dissimilis* are most probably the same species); Nicéy., *Gazetteer of Sikkim* p. 173. n. 485 (1894) (Sikkim, March to November, at low elevations).

Varies exceedingly in the amount of white on the wings. Sometimes the wings are black with very thin white lines; in other examples they are white with the veins narrowly black. The yellowish marginal spots of the hindwings are also variable in size, but are never so large as in the Andaman insect, *P. clytia flavolimbatus* Oberth.

Hab. Assam (25 ♂, 12 ♀); Bengal; Sikkim (19 ♂, 9 ♀); North-West India (2 ♂, 1 ♀); Southern India (1 ♂, 1 ♀).

(*b*): ***P. clytia lankeswara*** Moore [♂, ♀, larva, pupa].

- Papilio lankeswara* Moore, *P. Z. S.* p. 143. (1879) (Ceylon).
- Chilasa lankeswara* Moore, *Lep. of Ceylon I.* p. 154. t. 56. f. 2. 2a (*l.*). 2b (*p.*) (1881) (Ceylon).
- (?) *Papilio (Chilasa) clytia*, Ferguson, *Journ. Bombay N. H. Soc.* p. 416. n. 181 (1891) (Travancore: *this subspecies?*).

Differs from *P. clytia* L. in the umber-brown colour of the wings and in the small submarginal spots of the forewings; from *P. clytia panope* L. it is distinguished chiefly by the longer discal sagittiform spots of the hindwings.

This subspecies has been described from slightly aberrant specimens in which the submarginal spots of the forewings are partly obliterated; in most individuals the series of those spots is complete, and on such specimens Moore's *clytioides* is based.

(*e*²): ab. *clytioides* Moore.

Chilasa clytioides Moore, *loc.* p. 154. t. 56. f. 1 (*♂*) (1881) (Ceylon).

(*f*²): ab. *dissimilis* L.

Indistinguishable from the corresponding aberration of *P. clytia* L.

Hab. Ceylon (4 ♂, 9 ♀).

(c) : *P. clytia panope* L. [♂, ♀].

Papilio Nymphalis Phalexatus panope Linné, *Syst. Nat.* ed. x. p. 479. n. 131 (1758) Asia; id., *l.c.* ed. xii. p. 782. n. 196 (1767); Houtt., *Natural. Hist.* I. II. p. 334. n. 131 (1767); Mull., *Naturs.* V. I. p. 616. n. 196 (1774); Fabr., *Syst. Ent.* p. 512. n. 292 (1775); Goeze, *Ent. Beytr.* III. I. p. 196 (1779); Fabr., *Spec. Ins.* II. p. 102. n. 450 (1781) (*synon. excl.*); Cram., *Pap. Erot.* IV. p. 13. t. 295. f. E. F (1782) (China); Fabr., *Mus. Ins.* II. p. 55. n. 546 (1787); Gmelin, *Syst. Nat.* I. 5. p. 2326 n. 196 (1790) (*synon. ex p.*); Fabr., *Ent. Syst.* III. I. p. 59. n. 183 (1793) (*synon. ex p.*).

Papilio panopes, Godart, *Enc. Méth.* IX. p. 75. n. 142 (1819) (*p.p.*).

Papilio panope, Boisduval, *Spec. Gén. Léop.* I. p. 373. n. 218 (1836) (China); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 269 (1864) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 101. n. 321 (1879) (China; Burma; Cochin China).

Papilio panope Moore, *P. Z. S.* p. 840 (1878) (Upp. Tenasserim); Dist., *Rhop. Mal.* p. 355. n. 18. t. 27. f. 5 (1885) (Malay Pen.); Nicéy., *Journ. Bombay N. H. Soc.* p. 387. n. 94 (1890) (Chin-Lushai); Watson, *ibid.* p. 53 (1891) (Chin-Lushai).

Papilio panope, Marshall, *Journ. As. Soc. Beng.* p. 43. n. 8 (1882) (Upp. Tenasserim).

Papilio (Chilusa) panope, Elwes & Nicéy., *Journ. As. Soc. Beng.* p. 433. n. 126 (1886) (Tavoy).

Papilio clytia, Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 195 (1890) (Shan States).

The discal sagittate spots of the hindwings are shorter than in *P. clytia* L.; sometimes they have almost disappeared from the upperside.

Most frequently the marginal and submarginal markings of the forewings are more or less merged together and form in the apex of the wing three large patches, which are sometimes shaped as in *P. clytia palephates* Westw. Occasionally the spots of the forewings are obliterated.

(*g*²): ab. loc. *saturatus* Moore.

Papilio saturatus Moore, *P. Z. S.* p. 697 (1878) (Hainan).

Papilio panope, Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 74 (1887) (Hainan).

Ground-colour almost black instead of umber-brown.

This aberration occurs, besides in Hainan, in China (Hong-Kong).

(*h*²): ab. *dissimilis* L.

Not distinguishable from the corresponding aberration of *P. clytia* L.

Hab. Tenasserim (4 ♂, 2 ♀); Malacca (1 ♀); Shan States (7 ♂); Burma (4 ♂, 7 ♀); Hainan; Formosa (1 ♂); S.E. China (3 ♂, 2 ♀).

Specimens from the northern parts of Burma belong to *P. clytia clytia* L.

(d) : *P. clytia panopinus* Stauding. [♂, ♀].

Papilio panope var. *panopinus* Staudinger, *Iris* II. p. 9 (1889) (Palawan).

Papilio (Chilusa) palephates var. *panopinus*, Semper, *Philipp., Tagf. Ill.* p. 267. sub n. 389. t. 43. f. 8 (♀) (1891) (Palawan; 1 ♀ from Mindoro!).

The submarginal spots of the forewings stand closer to the margin than either in *clytia* and *panope*; when confluent with the small marginal spots they form such markings as are present in *P. polytes* ♂; disc of the forewings with three to four elongate spots; the apical patches smaller than in *P. clytia palephates* Westw. Below, the forewings have a whitish streak in the cell, and the hindwings bear also some ill-defined whitish elongate markings.

Hab. Palawan (3 ♂, 1 ♀); Mindoro.

In Mindoro this subspecies occurs together with the next, *i.e.* in Mindoro there occur specimens of *palephates* which are not distinguishable from *panopiinus*.

(e): ***P. clytia palephates*** Westw. [σ , φ].

- Papilio palephates* Westwood, *Proc. Ent.* II. p. 127. t. 79. f. 1 (φ) (1845) (Manila); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 21. n. 265 (1846) (Manila); Feldl., *Verh. z. b. Ges. Wien* p. 308. n. 270. & p. 355. n. 157 (1864) (Luzon); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 61. n. 88 (1865) (Philippine Is.); Oberth., *Et. d'Ent.* IV. p. 101. n. 325 (1879) (Manila); Dewitz, *Noct. Ac. Leop. Car. Ac. Naturf.* XLV. 2. p. 262. t. 9. f. 8. 8a. 8b. 8c (*l. p.*) (1882) (metamorphosis); Stauding., *Iris* II. p. 10 (1889).
- Papilio dissimilis* var. *palephates*, Gray, *Cat. Lep. Ins. B. M. I.* p. 72. sub n. 330 (1852) ("N. India" *loc. err.*); *id.*, *List Lep. Ins. B. M. I.* p. 84. sub n. 348 (1856) (Philippine Is.); Reak., *Tr. Ent. Soc. Phil.* p. 492. sub n. 28 (1864) ("common in the Philippines").
- Papilio (Chilasa) palephates*, Semper, *Philipp. Tagfalter* p. 266. n. 389. t. 43. f. 6. 7 (1891) (Luzon; Mindoro; Mindanao).

Basal third of the wings below marked with white, as in *panopiinus* Stauding.; apical patches of the forewings above large, but not touching the outer margin; marginal and submarginal spots of the forewings minute.

Hab. Philippines: Luzon (4 σ , 2 φ); Mindoro (1 σ); Mindanao.

(f): ***P. clytia flavolimbatus*** Oberth. [σ , φ].

- Papilio dissimilis* var. *flavolimbatus* Oberthür, *Et. d'Ent.* IV. p. 101. sub n. 323 (1879) (Andaman Is.; Pt. Blair).
- Papilio clytia* var. *flavolimbatus*, Wood-Mason, *Journ. As. Soc. Beng.* p. 238. n. 71 (1880) (Andaman Is.).
- Papilio (Chilasa) clytia* var. *flavolimbatus* Wood-Mason & Nicéville, *ibid.* p. 253. n. 100. t. 14. f. 1 & 2 (σ) (1881) (Andaman Is.).

Differs from *P. clytia* ab. *dissimilis* L. chiefly in the yellow marginal spots of the hindwings being larger above and below.

Hab. Andaman Islands (9 σ , 1 φ).

137. ***Papilio echidna*** Boisd. [σ , φ].

- Papilio dissimilis* var. *echidna* Boisduval, *Spec. Gén. Lep.* I. p. 378. sub n. 224 (1836) (Timor); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 42. t. 8. f. 6 (1840) (Timor); Vollenhov., *Tijdschr. v. Ent.* II. p. 88. sub n. 155 (1860) (Timor); Oberth., *Et. d'Ent.* IV. p. 100. sub n. 323 (1879) (Timor).
- Papilio dissimilis*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 21. n. 263 (1846) (*pp.*).
- Papilio dissimilis* var. *clytia*, Gray, *Cat. Lep. Ins. B. M. I.* p. 72. sub n. 330 (1852); *id.*, *List Lep. Ins. B. M. I.* p. 84. sub n. 349 (1856).
- Papilio echidna*, Feldl., *Verh. z. b. Ges. Wien* p. 308. n. 268 (1864) (Timor); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 61. n. 87 (1865) (Timor).

Similar in pattern to *P. clytia* ab. *dissimilis* L., but the marginal spots of the hindwings are small and white instead of yellow, above and below.

Hab. Lesser Sunda Islands: Timor (W. Doherty, November to December 1891) (5 σ , 2 φ); Wetter (W. Doherty, May 1892) (2 σ); Alor (W. Doherty, October 1891) (4 σ); Adonara (W. Doherty, November 1891) (1 σ); Moa (1 σ).

In two of my specimens from Alor the marginal and submarginal spots of the hindwings are much reduced in size.

If Java and Sumatra are inhabited by a representative *Papilio*, it will probably connect *P. echidna* Boisd. with *clytia* L.

138. (?) *Papilio lacedemon* Fabr.

- Papilio Eques Achirus lacedemon* Fabricius, *Ent. Syst.* III. 1. p. 36. n. 107 (1793) (Malabar).
Papilio lacedemon, Donovan, *Ins. of India* t. 17. f. 3 (1800); Godart, *Enc. Méth.* IX. p. 38. n. 41 (1819); Boisd., *Spec. Gén. Lép.* I. p. 374. n. 219 (1836); Doubl. Westw. & Hew., *Gen. Diurn. Lép.* I. p. 21. n. 267 (1846); Westw., *Cub. Or. Ent.* p. 20 (1848); Gray, *Cat. Lép. Ins. B. M.* I. p. 72. n. 331 (1852); id., *List Lép. Ins. B. M.* I. p. 84. n. 349 (1856); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 271 (1864).
Papilio clytia var. (?) *lacedemon*, Butler, *Cat. Diurn. Lép. descr. Fabric.* p. 244 sub n. 39 (1869).

Whether this *Papilio* is a variety of *P. clytia* L. we do not know with certainty; I have not seen a specimen of *clytia* which has a series of black submarginal lunules to the underside of the hindwings. I have, however, a specimen of *P. clytia puatope* L. with the submarginal spots of the forewings black instead of white, which renders it possible that *P. lacedemon* is also an individual aberration, and, judging from the locality "Malabar," belongs to *P. clytia lankeswara* Moore. The type-specimen of *P. lacedemon* Fabr. in Drury's collection has been the first and last known to science.

Hab. Malabar (acc. to Fabricius).

139. *Papilio paradoxus* (Zink.) [♂, ♀].

- ♂. *Zelima paradoxus* Zinken, *Nor. Act. Av. Nat. Cur.* XV. p. 162. t. 15. f. 9. 10 (1832) (Java).
 ♂. *Papilio paradoxus*, Doubl. Westw. & Hew., *Gen. Diurn. Lép.* I. p. 21. n. 268 (1846) (Java); Westw., *Cub. Or. Ent.* p. 19. t. 9. f. 1. 1* (1848) (Java); Gray, *Cat. Lép. Ins. B. M.* I. p. 72. n. 333 (1852) (Java); id., *List Lép. Ins. B. M.* I. p. 85. n. 351 (1856) (Java); Vollenhov., *Tijdschr. v. Ent.* III. p. 88. n. 157 (1860) (Java); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 274 (1864) (Java); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 60. n. 82 (1865) (Java); Oberth., *Et. d'Ent.* IV. p. 99. n. 314 (1879) (Java); Standing. & Schatz, *Exot. Schmett.* I. p. 6 (1884); Haase, *Untersuch. üb. Mim.* p. 47 (1893).

Four geographical forms of this *Papilio* are known:—

- (a): *P. paradoxus* Zink. from Java;
 (b): *P. paradoxus niusicus* subsp. nov. from Nias Island;
 (c): *P. paradoxus telesicles* Feld. from Borneo, Natuna Is., Sumatra, and Malacca;
 (d): *P. paradoxus telearchus* Hew. from Assam, Burma, and Tenasserim.

P. paradoxus from Borneo, Sumatra, and Malacca has been split up into a great number of "species," which are but mere individual aberrations of the variable *P. paradoxus telesicles* Feld. The number of such "species" can be increased enormously, as shown under (c); as they occur in the same district and are connected with one another by every intermediate, they are, however, scarcely worth being treated even as mere aberrations under different names. Whether all the Bornean aberrations occur also in Malacca and Sumatra I cannot tell, as the material of *paradoxus* obtained in these latter countries is not yet large enough; it is quite probable that some of the aberrations are local, but there is no character common to the Bornean specimens on the one hand, and another character common to the Malaccan or Sumatran examples on the other, so that *telesicles* cannot be divided into two or three geographical races.

(a): **P. paradoxus** (Zink.), forma typ. [♂].

The length of the bluish white discal streaks of the forewings varies a little; below, the number of the discal markings is sometimes reduced. The submarginal spots of the hindwings are variable in number, as in all subspecies of *paradoxus* (Zink.).

The female is recorded in *Naturalien-Cabinet*, August 1894, as being found by Mr. Prillwitz, but it is still undescribed.

Hab. Java (5 ♂).

(b): *P. paradoxus niasicus* subsp. nov. [♂, ♀].

Papilio paradoxa, Weymer (nec Zinken, 1832), *Stett. Ent. Zeit.* p. 271 (1885) (Nias I.).

♂. *Upperside*: forewings with the basal third bluish black, the rest blue; with a submarginal row of white spots, of which the three anterior ones are larger than in *paradoxa* (Zink.); the white discal streaks and the cellular spots of *paradoxa* are absent, but in one specimen they are just indicated by some blue scales.

Hindwings blackish brown, with a feeble blue tint on the anterior half in certain lights; two to four white submarginal spots.

Underside: both wings blackish brown, much darker than in *telesicles* Feld. Forewings without the white markings which are present on the disc and in the cell of *paradoxa*. Submarginal spots of either wing as large as above.

♀. *Upperside*: both wings dull blackish brown, without blue gloss. Forewings with a submarginal series of white spots, and with another series inside the first, but well separated from it; this subdiscal row consists of elongate, more or less arrowhead-shaped spots, the hindmost of which behind the lower median vein is doubled; a spot in the apex of the cell also white.

Hindwings with small white submarginal spots.

Underside as above, the markings a little less shaded with blackish scales.

Hab. Nias Island (3 ♂, 1 ♀).

The ♂ differs from *paradoxa* (Zink.) chiefly in the absence of the white subdiscal markings from either side of the forewings; from *telesicles* Feld. it is distinguished by the darker under surface and the large subapical spots of the submarginal series of the anterior wings.

The ♀ differs from *telesicles*-♀ in the two complete series of white markings on both sides of the forewings, which are otherwise uniformly blackish brown.

(c): *P. paradoxus telesicles* Feld. [♂, ♀].

♂ ♀. *Papilio paradoxus* var., Hewitson, *P. Z. S.* p. 422, t. 66, f. 4 (♀), t. 67, f. 1 (♂), 2 (♀), 3 (♀) (1859) (Borneo): Wüll., *Tr. Linn. Soc. Lond.* XXV, p. 60, sub n. 82 (1865) (Borneo: Sumatra).

♂ ♀. *Papilio telesicles* Felder, *Verh. z. b. Ges. Wien* p. 308, n. 273, & p. 355, n. 158 (1864) (*types*: Hewitson's figs. 1 & 2 of plate 67, *l.c.*).

(?) *Papilio* (?) *butleri*, Hagen, *Berl. Ent. Zeit.* XXXVII, p. 154, n. 172 (1892) (Banka I.).

Papilio paradoxus var. *zanou*, Hagen, *Iris* VII, p. 29, n. 10 (1894) (Sumatra).

My forty-eight specimens exhibit the following variation [the "hab." is that of the specimens in my collection]:—

I. *Males*.

(a²): *Upperside*: forewings with the basal third brownish black, rest of wing uniformly cyaneous blue, or, when placed between eye and light, of a purple colour. Hindwings ochreous brown, darker towards the base, with a tint of violet anteriorly; with three small violet-blue submarginal spots.

Underside: uniformly ochreous brown, a little darker towards the base; forewings with six rounded, hindwings with six angulated, small white submarginal markings, which have a faint blue tint. South-East Borneo.

(b²): Like (a²), but forewings above with three, and hindwings above with four, submarginal minute white spots. South-East Borneo.

(c²): Like (a²), but upperside more violet-blue. Forewings with five submarginal

spots, and with five faint discal blue streaks, and an indistinct spot in the end of the cell. Hindwings with a complete series of minute submarginal markings.

South-East Borneo.

(*d*²): Like (*a*²), but forewings with a complete series of white submarginal spots, with discal faint streaks composed of light blue scales, and a spot in the apex of the cell of the same colour. Hindwings with a submarginal row of spots, of which the four anterior ones are bluish white, the three posterior ones obsolete. Below, the forewings have seven, the hindwings eight, submarginal white spots.

South-East Borneo.

(*e*²): ♂-ab. *kerosa* Butl.

Papilio kerosa Butler, *Ent. Mo. Mag.* VI. p. 55. n. 1 (1869) (Sarawak): id., *Lep. Erot.* p. 33. t. 13. f. 2 (1869).

(?) *Papilio paradoxus* var. *kerosa*, Oberthür, *Et. d'Ent.* IV. p. 117. sub n. 311 (1879) (Malacca).

Upperside: forewings purple violet-blue, base brownish; with eight white submarginal spots shaded with violet-blue; four streaks near the end of the cell varying in length, a spot in the posterior angle of the apex of the cell and another very small cellular spot; cellular spot behind the subcostal vein whitish violet-blue.

Hindwings ochreous brown, darker at the base, with six minute white submarginal spots situated in feebly marked violet-blue streaks.

Underside as in (*d*²).

South-East Borneo.

(*f*²): Like (*e*²), but the forewings above with five or six short, light blue, discal streaks, and with one spot only in the cell. Hindwings without blue streaks in the cellules, and with four minute, white, submarginal spots.

South-East Borneo.

(*g*²): Like (*f*²), but forewings much less violet, more cyaneous; hindwings glossy blue near the outer margin in the cellules.

South-East Borneo.

(*h*²): Like (*f*²), but forewings cyaneous, violet when viewed from the side; hindwings with blue gloss, except in the anal region; submarginal spots of the hindwings above varying in number from four to seven.

South-East Borneo; Kina Balu; Lawas.

(*i*²): ♂-ab. *juda* Butl.

Papilio juda Butler, *Ent. Mo. Mag.* VI. p. 56. n. 3 (1869) (Sarawak): id., *Lep. Erot.* p. 34. n. 3. t. 13. f. 3 (1869).

Like (*h*²), but the blue colour forms distinct streaks within the cellules of the hindwings.

South-East Borneo.

(*k*²): ♂-ab. *zanoua* Butl.

Papilio zanoua Butler, *Ent. Mo. Mag.* VI. p. 56. n. 2 (1869) (Sarawak): id., *Lep. Erot.* p. 34. n. 1. t. 13. f. 1 (1869).

Papilio paradoxus var. *zanous*, Haase, *Untersuch. üb. Mon.* p. 47. t. 8. f. 54 (1893).

Like (*i*²), but hindwings without blue gloss.

South-East Borneo.

(*l*²): Like (*h*²), but the discal streaks of the forewings reaching the submarginal spots; hindwings as in (*h*²).

South-East Borneo.

(*m*²): Like (*l*²), but forewings above with five light blue streaks only; submarginal spots obsolete, or, when marked, four in number.

South-East Borneo.

(*n*²): ♂-ab. *distanti* nom. nov.

Papilio butleri Distant (nec Janson, 1879), *Rhop. Mal.* p. 352. t. 27a. f. 6 (1885) (Malacca).

Like (*l*²), but the whitish light blue markings on forewings larger.

Malacca.

(ω^2): Forewings as in (l^2), hindwings as (h^2). Borneo.

(p^2): ♂-ab. *butleri* Janson.

Papilio butleri Janson, *Cist. Ent.* II. p. 433. t. 8. f. 3 (1879) (Malacca: *type in my collection*).

Upperside: forewings velvety black, with two spots in the apex of the cell and a series of submarginal streaks of a cyaneous colour. Hindwings blackish brown, paler in the anal region, without blue gloss, with four minute, white, submarginal spots.

Underside: dark brown, submarginal series of spots on both wings complete; the spots on hindwings rather large. Malacca.

(q^2): ♂-ab. *aeonigma* Wall.

Papilio aenigma Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 60. n. 83. t. 7. f. 3 (1865) (Malacca: Sumatra).

Upperside: forewings bluish black, with a series of submarginal spots joined to narrow blue streaks; spot in apex of cell light blue

Hindwings dark brown, with an incomplete or complete series of submarginal minute spots tinged with blue.

Underside: submarginal spots rather large. Borneo.

On the underside of the forewings there are sometimes traces of the white discal markings of *P. paradoxus* (Zink). A specimen of ab. (i^2) has a series of five faint, discal, arrowhead-shaped spots on the underside of the hindwings.

11. *Femules*.

(r^2): ♀-ab. *daja* nom. nov.

Papilio jada Butler, *Ent. Mo. Mag.* VI. p. 56. n. 3 (♀, *nee* ♂) (1869) (Sarawak): id., *Lep. Exot.* p. 34. n. 3. t. 13. f. 4 (1869).

Upperside: basal half of forewings and basal two-thirds of hindwings marked with whitish longitudinal streaks. Forewings with a white spot in the apex, and with a row of light blue and white arrowhead-shaped markings on the outer part of the disc; with eight white submarginal spots; round these spots the wing has a strong blue gloss.

Underside: the white streaks longer; without blue.

South-East Borneo; Bunguran; Sumatra.

(s^2): Like (r^2), but hindwings with four or five submarginal violet streaks.

South-East Borneo.

(t^2): ♀-ab. *russus* nom. nov.

Papilio paradoxa var., Hewitson, *P. Z. S.* p. 423. t. 67. f. 3 (1859).

Papilio aenigma ♀ (?) Wallace, *l.c.* (1865).

Upperside without blue gloss. Forewings with five long subapical whitish streaks, and two spots of the same colour in the apex of the cell; submarginal spots present, the anterior ones merged together with the subapical streaks. Hindwings uniformly blackish brown, with a series of white angulated submarginal spots.

Borneo.

(u^2): ♀-ab. *nepticula* nom. nov.

Papilio butleri, Distant (*nee* Janson, 1879), *Rhop. Mal.* p. 352. t. 27. f. 6 (1885).

Like (t^2), but forewings paler brown, with one white spot within cell; subapical white streaks less defined. Malacca.

(*v*²): Like (*t*²), but forewings with blue gloss anteriorly on the disc. Borneo.

(*w*²): ♀-ab. *haasei* nom. nov.

Papilio paradoxus var. *zanous*, Haase (*rev*^o Butler, 1869), *Untersuch. üb. Mim.* p. 47. t. 8. f. 55 (1895) (Malacca).

Like (*t*²), but much paler brown; blue discal streaks on forewings short, not joined to the submarginal spots. Malacca.

(*x*²): ♀-ab. *leucothoides* Honr.

Papilio paradoxa var., Hewitson, *P. Z. S.* p. 423. t. 66. f. 4 (1859) (Borneo).

Papilio aenigma ♀ var. (?), Wallace, *l.c.* p. 60. sub n. 83 (1865).

Papilio schönbergianus ♀ Honrath, *Berl. Ent. Zeit.* p. 441 (1891) (Borneo).

Papilio paradoxus var. *leucothoides* Honrath, *l.c.* 490 (1892).

Upperside: blackish brown. Forewings with the submarginal spots suffused with brown; hindwings as in (*t*²).

Underside as above, but hindwings with feeble greyish brown streaks within the cellules. Bunguran; Borneo.

(*y*²): Like (*w*²), but forewings with bluish gloss in the outer region. Borneo.

Dr. Hagen describes a *female* of a *Papilio* in *Berl. Ent. Zeit.* XXXVII. p. 155. n. 173 (1892) as *Papilio* (?) *butleri* var. *fuscus* from Banka Island. As Hagen does not say anything about the neuration, by which the *clyti*-group is so easily distinguished from the *macareus*-group, I cannot tell whether this *fuscus* really belongs to *paradoxus*. I enumerate it here as—

(*z*²): ♀-ab. *fuscus* Hagen, *l.c.*

Both sides of the wings brown; forewings with one, hindwings with two series of submarginal spots.

This insect may turn out to be *P. astina* Westw., which is the *female* of *P. macareus striatus* Zink.

Hab. Borneo (26 ♂, 11 ♀); Bunguran, Natuna Is. (2 ♀); Malacca (3 ♂, 2 ♀); Sumatra (3 ♂, 1 ♀).

(*d*): **P. paradoxus telearchus** Hew. [♂. ♀].

♂. *Papilio telearchus* Hewitson, *Tr. Ent. Soc. Lond.* (2). II. p. 22. t. 6. f. 3 (♂) (1852) (Sylhet); Gray, *Cat. Lep. Ins. B. M. I.* p. 72. n. 332 (1852) (Sylhet); id., *List Lep. Ins. B. M. I.* p. 85. n. 350 (1856) (Sylhet); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 272 (1864); Moore, *P. Z. S.* p. 839 (1878) (Hatsiega).

♂. *Papilio paradoxa* var. *telearchus*, Oberthür, *Et. d'Ent.* IV. p. 99. sub n. 314 (1879).

♂. *Papilio* (*Euploopsis* subg. nov., Nicéville) *telearchus*, Elwes & Nicéville, *Journ. As. Soc. Beng.* p. 433. n. 122 (1886) (Tavoy & Pongkai; "Euploopsis" *nove. nuda*).

Isaniopsis telearchus, Moore, *New Ind. Lep. Ins.* p. 284 (1888) (descr. of genus *Isaniopsis*): Swinh., *Tr. Ent. Soc. Lond.* p. 314. n. 403 (1893) (Khasia Hills).

♀. *Papilio* (*Euploopsis*) *telearchus*, Doherty, *Journ. As. Soc. Beng.* p. 130 (1889) (Sadiya; ♀ dimorphic); Nicéville, *Journ. Bomb. N. H. Soc.* p. 169. n. 8. t. A. f. 5 (♀) (1889) (*first descr. of ♀*; Assam; Tavoy; Pongkai).

♀. *Papilio telearchus*, Swinhoe, *Proc. Ent. Soc. Lond.* p. 31 (1894) (Cherra Punji).

♂. Larger than *paradoxus* Zink. Variable like *telesicles* Feld.; my specimens are all different from one another.

♀. Also variable. Very rare in collections; first noticed by W. Doherty (*l.c.*) in 1889. The *female* specimen described and figured by De Nicéville is in my Museum (from coll. Rev. Hamilton).

Hab. Assam (9 ♂, 2 ♀); Burma; Tenasserim.

140. *Papilio caunus* Westw. [♂].

Papilio caunus Westwood, *Cab. Or. Ent.* t. 9, f. 2, 2* (♂) (1818) (Java?); id., in Doubl.'s *Gen. Diurn. Lep.* II, p. 529 (1852); Gray, *Cat. Lep. Ins. B. M.* I, p. 72, n. 334 (1852) ("Sylhet" loc. err., subsp. *albica*?); id., *List Lep. Ins. B. M.* I, p. 85, n. 352 (1856) (*p.p.*?); Vollenhov., *Tijdschr. v. Ent.* III, p. 88, n. 158 (1860) (Java); Feld., *Verh. z. b. Ges. Wien* p. 308, n. 275 (1862) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV, p. 60, n. 84 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV, p. 100, n. 316 (1879) (Java).

Four subspecies compose this species:—

- (a): *P. caunus* Westw. from Java;
- (b): *P. caunus aegialus* Dist. from Malacca and Sumatra;
- (c): *P. caunus mendax* subsp. nov. from Borneo; and
- (d): *P. caunus danisepta* Butl. from Tenasserim to Assam.

(a): **P. caunus** Westw., forma typ. [♂].

This seems to be the rarest form. My single *male* specimen agrees almost exactly with Westwood's figure.

The *female* is unknown.

Hab. Java (1 ♂).

(b): **P. caunus aegialus** Dist. [♂].

Papilio caunus, Wallace (*see* Westwood, 1848), *Tr. Linn. Soc. Lond.* XXV, p. 60, n. 84 (1865) (*p.p.*); Stauding & Schatz, *Exot. Schmett.* I, p. 6 (1884) (*p.p.*).

Papilio caunus Westw., race *aegialus* Distant, *Ann. Mag. N. H.* (5), XII, p. 352 (1883) (Malay Pen.).

Papilio aegialus Distant, *Rhop. Mal.* p. 353, n. 16, t. 27b, f. 5 (♂) (1885).

Papilio velutinus Butler, *Ann. Mag. N. H.* (5), XVI, p. 343, sub u. 109 (1885) (Sumatra).

♂. The white patch in the apex of the cell of the forewings is larger than in *caunus*; the submarginal spots are smaller. Hindwings a little more rounded, with the median nervules more thinly black.

♀. Unknown.

Hab. Malay Peninsula (3 ♂); Sumatra.

The type-specimen of *aegialus* Dist., now in my collection, does not differ from that of *velutinus* Butl. in the British Museum, except in the submarginal markings of the hindwings, which are a little smaller in *velutinus*; one of my three *aegialus* from Malay Peninsula has these spots, however, not larger than the type of *velutinus*.

(c): **P. caunus mendax** subsp. nov. [♂, ♀].

Papilio caunus, Gray (*see* Westwood, 1848), *List Lep. Ins. B. M.* I, p. 72, n. 334 (1856) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 308, n. 275 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV, p. 60, n. 84 (1865) (*p.p.*); Stauding & Schatz, *Exot. Schmett.* I, p. 6 (1884) (*p.p.*); Honrath, *Berl. Ent. Zeit., Sitzungsber.* p. 19 (1892) (Borneo: descr. of ♀); Haase, *Untersuch. üb. Mim.* t. 8, f. 53 (♂) (1893) (Borneo).

The Bornean form, which erroneously is regarded by all authors as belonging to typical *caunus* Westw., differs considerably from the Javan race, and must stand as a subspecies of *caunus*.

♂. *Upperside*: both wings violet-blue. Forewings with the white patch in the apex of the cell larger than in *caunus* Westw.; submarginal spots smaller. Hindwings more rounded; white markings reduced in size and number; there are only four spots, namely, one streak posteriorly within the cell and another behind the cell, both rather long and broad, and two very small spots between the median nervules.

Underside as in *caunus* Westw., but hindwings with a streak in the cell, another before and three more behind the cell.

♀. My two specimens, one from the Kina Balu, the other from Lawas, are remarkably different from one another. In the Kina Balu example both wings are brown above; the forewings have a series of blue discal streaks, which become shorter behind and are terminated exteriorly by white submarginal spots; the three anterior ones of the latter are the largest and about twice as long as broad; the three blue streaks standing between the lower median and lower discoidal veins are discally joined each to a more or less wedge-shaped white mark, of which the anterior one is separated from the large cellular white patch only by the black lower discocellular vein; base of the forewings with two feeble whitish lines, one in the cell, the other at the inner margin. Hindwings with the whole cell, two long and narrow streaks before the cell, four smaller ill-defined markings round the apex of the cell, and more than the basal half of the cellule before the submedian vein white, shaded with brown; the discal spots shade exteriorly into violet-blue.

Underside paler than the upperside, without blue spots, but the submarginal white markings of either wing with a faint tint of blue. White markings nearly as above, but the basal half of the forewings with several lines in the cell, confluent at the base, and two lines behind the cell.

In the Lawas specimen the outer half of the forewings is purple; the cellular patch is not larger than in the *male*; there are four small white discal spots, of which the two posterior ones are edged with cyaneous; basal half much paler ochreous than in the Kina Balu individual. Hindwings with the white markings of the basal half much reduced, the spots at the end of the cell very faint; disc with intercellular purple streaks.

Hab. Borneo (8 ♂, 2 ♀).

A ninth *male* in my collection, which is probably from Sandakan, North-East Borneo, has the cellular patch of the forewings reduced to a transverse bar, being more than twice as long as broad; the patch is much shaded with blue. The white spots of the hindwings are also much reduced.

(d): *P. caunus danisepa* Butl. [♂, ♀].

Papilio caunus, Gray (*rev* Westwood, 1848), *Cat. Lep. Ins. B. M.* I. p. 72. n. 334 (1852) (Sylhet); id., *List Lep. Ins. B. M.* I. p. 72. n. 334 (1856) (*p.p.*); Feld., *Vrch. z. b. Ges. Wien* p. 308. n. 275 (1864) (*p.p.*).

Papilio danisepa Butler, *Ann. Mag. N. H.* (5). XVI. p. 343. n. 109 (1885) ("near Assam").

Papilio (Euplocopsis) danisepa, Nicéville, *Journ. Bomb. N. H. Soc.* t. q. f. 48 (♀) (1895) (Assam; Burma; Tenasserim).

Isaniopsis danisepa, Swinhoe, *Tr. Ent. Soc. Lond.* p. 314. n. 405 (1893) (Cherra Punji).

♂. Larger than the other subspecies; hindwings more distinctly scalloped. The cellular and discal markings of the forewings, and the white colour at the base of the hindwings, more extended. The submarginal spots of the hindwings disappear sometimes from the upperside. In some Khasia Hills examples there are two additional white spots outside the apex of the cell of the forewings. My Tenasserim specimen has rather less blue.

♀. Rather larger than the *male*, with the white markings a little more extended. The submarginal spots are well marked on both wings above and below.

Hab. Assam (5 ♂); Burma; Tenasserim (1 ♂).

XXII. ELEPHENOR-GROUP.

Male with woolly stripes on the forewings. Both sexes with the head buff-colour, and sides of abdomen creamy buff.

141. *Papilio elephenor* Doubl. [♂, ♀].

- ♂. *Papilio elephenor* Doubleday, *Ann. Mag. N. H.* XVI, p. 305 (1845) (Sylhet); id. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 10, n. 36 (1846); Westw., *Cab. Or. Ent.* p. 64, t. 31, f. 2, 2* (1848); Moore, *P. Z. S.* p. 672 (1867) (Sylhet); Doherty, *Journ. As. Soc. Beng.* p. 130 (1889) (Sadiya).
- ♂. *Papilio elephenor*, Gray, *Cat. Lep. Ins. B. M.* I, p. 15, n. 53 (1852); id., *List Lep. Ins. B. M.* I, p. 18, n. 57 (1856) (Sylhet); Feld., *Vrch. z. b. Ges. Wien* p. 324, n. 465, & p. 372, n. 277 (1864).
- ♂ ♀. *Papilio elephenor*, Haase, *Vatersuch. ib. Min.* p. 52 (1893) (monomorphic species).

This curious insect combines the characters of the *bianor*-group and the *bootes*-group; it has the blue and green dispersed scaling on the upperside of the wings and the cottony stripes of the *bianor*-group, and the buffish colour of the body of the *bootes*-group. Two specimens from the Khasia Hills present rather obvious differences from those obtained by Mr. Sherwill in the Naga Hills: they are decidedly smaller; on the upper surface of the hindwings they are more densely covered with blue and green scales, the red anal mark forms a complete ring, and there is a small submarginal red lunule between the lower median nervules which is not present in the Naga Hills specimens; below, the red submarginal patches of the hindwings are much more densely covered with violet scales; the edges of the hindwings are more deeply scalloped.

In specimens from both localities the fifth submarginal spot on the hindwings below is sometimes obliterated or almost so.

♀. Agrees with the *male*. The anal red mark on the hindwings above is larger, rounded, marginal, and includes a small black spot; the outer margin of the hindwing is distinctly sinuate between the median veins, and at the end of the upper median nervule produced into a short but obvious tooth, as at the extremity of the lower discoidal vein.

Hab. North India: Khasia Hills (2 ♂); Naga Hills (6 ♂). The *female* in Dr. Staudinger's collection from Assam.

XXIII. BIANOR-GROUP.

Male with woolly streaks on the forewings.

142. *Papilio bianor* Cram. [♂, ♀, larva].

- Papilio Eques Trajanus bianor* Cramer, *Pap. Ec.* II, p. 40, t. 103, f. c (1777) (China); Goetze, *Ent. Beytr.* III, 1, p. 43, n. 19 (1779); Fabr., *Spec. Ins.* II, p. 1, n. 2 (1781); Jahlonsky & Herbst, *Natures. Schmett.* II, p. 158, n. 38 (1784); Fabr., *Mon. Ins.* II, p. 1, n. 2 (1787); Gmelin, *Syst. Nat.* I, 5, p. 2226, n. 275 (1790); Esper, *Anal. Schmett.* p. 137, n. 62, t. 35, f. 2 (1792?); Fabr., *Ent. Syst.* III, 1, p. 1, n. 2 (1793).
- Achilides bianor*, Hübner, *Verz. bek. Schm.* p. 85, n. 873 (1816).
- Papilio paris*, Godart, *Enc. Meth.* IX, p. 67, n. 116 (♀, *ne* ♂) (1819) (China).
- Papilio bianor*, Boisduval, *Spec. Gén. Lep.* I, 205, n. 17 (1836) (China); Doubl. Westw. & Hew., *Cat. Lep. Ins. B. M.* I, p. 11, n. 45 (1846) ("N. India" *loc. err.*); Gray, *Cat. Lep. Ins. B. M.* I, p. 16, n. 64 (1852) ("N. India" *loc. err.*); id., *List Lep. Ins. B. M.* I, p. 20, n. 68 (1856) (China); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I, p. 110, n. 220 (1857) ("N. India" *loc. err.*); Feld., *Vrch. z. b. Ges. Wien* p. 323, n. 448 (1864) (China, *nee* Japan); Reak., *Tr. Ent. Soc. Phil.* p. 457, n. 7 (1864); Butl., *Cat. Diurn. Lep. descr. Fabr.* p. 256, n. 71 (1869) (Shanghai); Oberth., *Et. d'Ent.* IV, p. 39, n. 23 (1879) (China); Elwes, *P. Z. S.* p. 871 (1881); Lecch, *ibid.* p. 404, n. 3 (1887) (*p.p.*); id., *loc. cit.* p. 114, n. 66 (1889) (Kin-Kiang); id., *Butterfl. from China*, etc. p. 527 (1893) (*p.p.*); Seitz, *Stett. Ent. Zeit.* LIV, p. 373 (1894).

As this insect is sexually dimorphic and varies according to season and locality, it has received a good many names: *P. bianor* Cram., *dehaani* Feld., *japonicus* Butl., *tatunus* Fent., *alliacmon* Orza, *lorquini* Reak., *dialis* Leech, *syfanus* Oberth., *paris* Godart, *maucki* Mén., *raddei* Brem. After examination of long series of specimens, I come to the conclusion that all these "species" and "varieties" belong to *bianor* Cram., the range of which extends, therefore, from Thibet over China to Japan and Amurland.

Four rather well characterised geographical forms of *P. bianor* Cram. can be distinguished, namely:—

- (a): *P. bianor* Cram., inhabiting China;
- (b): *P. bianor dehaani* Feld. from Japan;
- (c): *P. bianor maucki* Mén. from North Japan and Amurland;
- (d): *P. bianor syfanus* Oberth. from Western China and Thibet.

(a): **P. bianor** Cram., forma typ. [♂, ♀].

The cottony stripes on the forewings of the *male* are not at all so constant as Leech (*Butt. of China, l.c.*) says; I have specimens in which all the stripes are separated from one another; and such a variability is not to be wondered at, as we find the cottony stripes variable in size and number in all the species where they appear; in some insects, for example in *P. erio* Fabr. and *montrouzieri* Bois-d., these sexual marks vary even to such an extent that certain individuals have the stripes developed, while others have no stripes at all.

The whitish colour of the outer region of the forewings beneath is sometimes much restricted, in other examples the whitish scales are scattered almost over the whole wing.

The specimens of the spring brood are much smaller than those of the summer broods, which are typical *P. bianor* Cram.

Hab. China (except the extreme south and north) (30 ♂, 15 ♀).

(b): **P. bianor dehaani** Feld. [♂, ♀].

Papilio bianor var., De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 28. t. 5. f. 1. 2 (1840) (Japan).

Papilio dehaani Felder, *Verh. z. b. Ges. Wiza* p. 323. n. 451. & p. 371. n. 268 (1864); Murray, *Ent. Mo. Mag.* p. 166 (1874) (Yokohama); Oberth., *Et. d'Ent.* IV. p. 39. n. 24 (1879) (Japan);

Elwes, *P. Z. S.* p. 871 (1881); Butler, *Ann. Mag. N. H.* (5). XI. p. 113. n. 21 (1883) (Corea!);

♀. *Papilio lorquini* Reakirt, *Proc. Ent. Soc. Phil.* p. 462. n. 11 (1864) ("Philippines" *loc. err.*).

Papilio maucki, Pryer, *Rhop. Nihon.* p. 3. n. 3 (1886) (*p.p.*).

Papilio bianor var. *dehaani*, Leech, *Butt. from China*, etc. p. 527 (1893).

Differs from *P. bianor* Cram. chiefly in the whitish scaling of the outer region of the forewing below being restricted to a more or less narrow band.

Mr. Butler [*Ann. Mag. N. H.* (5). XI. p. 113. n. 21 (1883)] says that *P. dehaani* has at least two scarlet submarginal spots to the upperside of the hindwings, whereas his *P. japonicus* has never more than two and sometimes none at all; this statement is erroneous, typical *dehaani* having only the anal mark partly red (compare De Haan's fig.). The number of the scarlet submarginal spots is very variable in every brood, as is the breadth of the whitish band on the forewings beneath.

(a²): ab. gen. vern. *japonicus* Butl.

Papilio japonica Butler, *Journ. Linn. Soc. Lond., Zool.* IX. p. 50. n. 1. note (1866) (Japan: *see* China; "N. India" *loc. err.*).

Papilio alliacmon Orza, *Lep. Jap.* p. 9 (1869) (Japan).

Papilio dehaani var. *japonica*, Elwes, *P. Z. S.* p. 871 (1881).

Papilio bianor var. *japonica*, Leech, *Butt. from China*, etc. p. 528 (1893).

Much smaller than the summer brood.

(b²): ab. gen. aest. *dehaani* Feld.

Felder's name was given to De Haan's figures, which represent specimens of the large summer brood.

Hab. Japan (excl. of North Yesso) (37 ♂, 7 ♀); Corea (according to specimens in the British Museum).

(c): **P. bianor maacki** Mén. [♂, ♀, larva].

Papilio maacki Ménotriés, *Bull. Ac. Petersb.* XVII. p. 212. n. 1 (1859) (Amur); id., in Schrenk's *Reis.* II. p. 10. n. 1. t. 1. f. 1. 2 (1859); Brem., *Lep. Ost-Sib.* p. 3. n. 1 (1864); Feld., *Verh. z. b. Ges. Wien* p. 323. n. 450 (1864); Butl., *P. Z. S.* p. 814. n. 38 (1877) ("Formosa" loc. err. !); Oberth., *Et. d'Ent.* IV. p. 39. n. 25 (1879) (*raddei* and *maacki* are seasonal forms of the same species; Askold l.); Elwes, *P. Z. S.* p. 871 (1881); Pryer, *Tr. Ent. Soc. Lond.* p. 487 (1882) (*p.p.*); id., *Rhop. Nihon.* p. 3. n. 3. t. 1. f. 3 (1886) (*p.p.*) (Japan); Leech, *P. Z. S.* p. 404 (1887) (*p.p.*); Fixsen, *Rom. Mém. Léop.* III. p. 254. n. 2 (1887) (Corea); Graeser, *Berl. Ent. Zeit.* p. 62. n. 3 (1888) (Amur); Stauding., *ibid.* VI. p. 229. n. 3 (1892) (Amur; N. China); Ruhl, *Grossschmett.* p. 84 (1892); Leech, *Bull. from China*, etc. p. 529 (1893) (Amurland; Japan; Corea; N. China); Ruhl & Heyne, *Grossschmett.* p. 695 (1895) (larva descr.).

Papilio dehaani var. (?) *tutamus* Fenton, *P. Z. S.* p. 855 (1881) (Yesso).

Papilio tutamus, Elwes, *P. Z. S.* p. 871 (1881) (Yesso).

Papilio jutanus, Ishikowa, *Papilio* II. p. 36. n. 4. f. 13. 14 (1882) (Yesso and high mountains of the main island).

The costal margin of the hindwings is a little longer than the abdominal margin, while in *bianor* it is shorter than the latter. The green median band on the upperside of the hindwings and the buffish median band of the same wings below are, together with the different form of the hindwings, the chief characters by which this subspecies is distinguishable from *P. bianor* and *P. bianor dehaani*; but there exist all intergradations between these races.

As in the other subspecies, the spring and summer broods are different, especially in size:—

(c²): ab. gen. vern. *raddei* Brem.

Papilio raddei Bremer, *Mém. Ac. Petr.* VIII. p. 3. t. 1. f. 1 (1861) (Bureja).

The forewings have often a very bright green submarginal band including some creamy buff spots. The band on the underside of the hindwings is broader than in the summer broods.

(d²): ab. gen. aest.: *P. maacki* Mén.

The buffish band on the underside of the hindwings is sometimes wanting, and the greenish band on the upper surface of the same wings abbreviated; such specimens are scarcely separable from *P. bianor dehaani* Feld.

Hab. Amur (10 ♂, 5 ♀); North China; Corea; Yesso and Nippon (6 ♂, 2 ♀).

The Japanese specimens cannot be subspecifically separated from the continental individuals.

(d): **P. bianor syfanus** Oberth. [♂, ♀].

Papilio syfanus Oberth., *Et. d'Ent.* XI. p. 13. t. 1. f. 3 (1886); Leech, *Bull. from China*, etc. p. 532. t. 32. f. 5 (♂) (1893) (W. China at higher elevations).

This seems to me to be a Tibetan insect, which in Western China occurs only at higher elevations from 5000 to 9000 feet (cf. Leech, *l.c.*), and comes at 5000 to

6000 feet together with *bianor*, which inhabits in Western China the localities of lower elevation.

It differs from *P. bianor* especially in the almost uniform blackish colour of the underside of the forewings.

In size *P. bianor syfanus* is the same as the spring brood of *bianor*.

The anal angle of the forewings below bears often a short whitish band. The base and disc of the under surface of the posterior wings is of a paler colour than in *bianor*. Many specimens have two whitish discal patches on the hindwings, which are mentioned by Oberthür in the description, but not represented in the figure.

My *female* specimen has very large, red, submarginal spots on the hindwings; those of the underside are partly merged together with the marginal reddish ochreous markings.

(*a*²): ♂-ab. *dialis* Leech.

Papilio dialis Leech, *Entom.* XXVI, Suppl. p. 104 (1893) (W. China); id., *Butt. from China*, etc p. 532. t. 32. f. 4 (♂) (1893) (one specimen, Chia-ting-fu).

Mr. Leech says (*Butt. from China, l.c.*): "This species is most readily distinguished from *P. bianor*, *maacki*, etc., by the different arrangement of the silky sexual bands on the primaries of the *male*." In the type-specimen, which is unique, the cottony streak between the submedian and lower median veins is wanting. As already explained, the cottony stripes in *bianor* and all the allied species are variable, and the presence or absence of one of the stripes can certainly not be valued as a "specific" character. Further, in *dialis* the "under surface of primaries is pale grey, merging into white on the outer two-thirds of inner marginal area." This whitish area is indicated in certain examples of *syfanus* as well as of *bianor*, and is also scarcely of specific value. All the other characters, however, in which the unique specimen of *dialis* differs from *syfanus* are certainly individual, as in the distribution of the green and blue scales, in the development of the submarginal spots of the hindwings, etc., the specimens of *bianor* or a number of individuals of *syfanus* differ *inter se* more than *dialis* does in this respect from *syfanus*.

Hab. Western China (12 ♂, 1 ♀); and probably Tibet proper.

143. *Papilio polyctor* Boisid. [♂, ♀].

Papilio polyctor Boisduval, *Spec. Gén. Léop.* I. p. 205. n. 18 (1836) (Cashmere); Blanch., in Jacquemont, *Voy. Ind.* IV. *Ins.* p. 14. n. 2. t. 1. f. 1. 2 (1841); Doubl. Westw. & Hew., *Geo. Dirr.*, *Lep.* I. p. 11. n. 46 (1846); Kollar, in Hügel's *Kaschmir* IV. 2. p. 403. t. 1. f. 1. 2 (1848) (Cashmere); Gray, *Cat. Lep. Ins. B. M.* I. p. 16. n. 65 (1852); id., *List Lep. Ins. B. M.* I. p. 20. n. 69 (1856) (Bengal; Nepal; Punjab); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 169. n. 217 (1857); Feld., *Verh. z. b. Ges. Wien* p. 323. n. 447 (1864) ("Darjeeling" *loc. cit.*); Moore, *P. Z. S.* p. 487 (1865) (N.W. Himalaya); Oberth., *El. d'Ent.* IV. p. 39. n. 26 (1879); Standring. & Schatz, *Exot. Schmitt.* I. p. 8 (1884); Butl., *P. Z. S.* p. 377. n. 85 (1886) (W. India); id., *Ann. Mag. N. H.* (6). I. p. 206. n. 96 (1888) (N.W. India). *Sarbaria polyctor*, Moore, *P. Z. S.* p. 258 (1882) (N.W. Himal.; descr. of genus *Sarbaria* Moore). *Papilio (Sarbaria) polyctor*, Doherty, *Journ. As. Soc. Beng.* p. 136. n. 227 (1886) (Kumaon, 2000 to 5000 feet).

This is the Indian representative of *P. bianor* Cram.; it ranges from Afghanistan to Tonkin, and occurs at low elevations. As in almost every Indian species of *Papilio*, the individuals from the western districts are different from those from the eastern parts of the range, and have been regarded as belonging to two distinct species, namely *P. polyctor* Boisid. and *P. ganesa* Doubl. The differences between Cashmere

examples of *polyctor* and Assam specimens of *ganesa* are indeed considerable. Above, the bright green submarginal band of the forewings of *P. polyctor* Boisd. is shorter and less conspicuous in *ganesa*; the bluish green patch of the hindwings is broader in *ganesa*, does not extend beyond the upper median nervule, and has a deeper blue tint; the green scaling of the upper surface of both wings is denser in *polyctor*; beneath, the forewings of *ganesa* have a broad whitish submarginal band nearly as in *P. parisi*, which gradually widens anteriorly and becomes much shaded with black; in *polyctor* this band is very narrow, and obviously marked only behind; the buffish scaling with which nearly the whole of the hindwings of *polyctor* is covered is much more restricted in *ganesa*. Though typical *polyctor* and typical *ganesa* are thus most readily distinguishable, there occur specimens which combine the characters of the two. I have individuals of *polyctor* with a broad green band on the forewings, the bluish green patch of the hindwings prolonged to the abdominal margin, and the buffish scaling of the under surface of the posterior wings much extended, and with the whitish band on the underside of the forewings as broad as in certain examples of *ganesa*; in other individuals of *polyctor* the patch of the hindwings does not reach beyond the upper median nervule, just as in *ganesa*; in others again the buffish scaling of the underside of the hindwings is as much restricted as in many *ganesa*. On the other hand, in some Sikkim specimens of *ganesa* the green band of the forewings is broader than in certain individuals of *polyctor*, and has the same length; the patch of the hindwings has sometimes the same tint as in *polyctor*, the buffish scaling of the hindwings below is often more extended than usual, and the whitish band of the forewings below is occasionally much reduced in breadth; in none of my *ganesa* specimens is the green scaling of the upper surface quite so dense as in *polyctor*.

The differences between the two "species" are, therefore, not constant, and I am obliged to sink *P. ganesa* to the rank of a subspecies of *P. polyctor*.

(a): **P. polyctor** Boisd., forma typ. [♂, ♀].

The number of the cottony streaks on the forewings of the *male* varies from two to five. The red submarginal spots of the underside of the hindwings appear often also above, especially in the *females*, which have sometimes all six spots marked. The bluish green patch of the hindwings is in some specimens only of half the breadth of the patch of others. The patch is connected with the abdominal margin by means of three greenish spots, situated between the upper median and the submedian veins; the size of these spots is very variable; in most specimens the posterior spot is absent, in others the second and third are wanting, and in others again all three are obliterated, as in Boisduval's type (according to the description); in the *females* those spots are apparently always absent.

The spring and summer broods differ in a similar way as in *P. bianor* Cram.

(a'): ab. gen. vern. *peeroza* Moore.

Sarbaria peeroza Moore, *P. Z. S.* p. 258 (1882) (Dharmasala, N.W. Himal.).

Smaller than specimens of the summer broods, and the submarginal red spots of the upperside of the hindwings usually larger in both sexes.

(b'): ab. gen. aest. *P. polyctor* Boisd.

As Boisduval says of his *polyctor*, "Se rapprochant un peu de *machaon* par le port," his type-specimen (now lost) seems to have been intermediate in size

between *peyzoa* and those larger individuals which are usually regarded as being typical *polyctor* Boisid.

Hab. Cashmere (18 ♂, 2 ♀); Afghanistan (1 ♀); North-West India (Kunmaon, Muree; 10 ♂, 8 ♀); Western Nepal (1 ♂).

(b) : ***P. polyctor ganesa*** Doubl. [♂, ♀].

Papilio ganesa Doubleday, Gray's *Zool. Misc.* p. 73 (1842) (Nepal: Assam); id. Westw. & Hew., *Gen. Diurn. Lep.* 1, p. 11, n. 48 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 16, n. 66, t. 3, f. 5 (♂) (1852) (probably only a var. of *polyctor* Boisid.); id., *List Lep. Ins. B. M. I.* p. 20, n. 70 (1856) (Nepal; Sylhet); Horsf. & Moore, *Cat. Lep. Ins. B. M. I.* p. 107, n. 214. (1857) (Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 323, n. 446. & p. 371, n. 266 (1864) (Sylhet; Nepal: Darjeeling); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Oberth., *Et. d'Ent.* IV, p. 40, n. 29 (1879) (Assam); Stauding. & Schatz, *Exot. Schmett.* 1, p. 8, t. 5 (♂) (1884); Butl., *Ann. Mag. N. H.* (5), XVI, p. 344, n. 111 (1885) (near Assam); Elwes, *Tr. Ent. Soc. Lond.* p. 428, n. 407 (1888) (Sikkim; lower valleys, occurs from April to December in successive broods); Robbe, *Ann. Soc. Ent. Belg.* p. 125, n. 10 (1892) (Darjeeling); Oberth., *Et. d'Ent.* XVII, p. 4 (1893) (Tonkin).

Sarbaria ganesa, Swinhoe, *Tr. Ent. Soc. Lond.* p. 312, n. 376 (1893) (Khasia Hills).

Papilio (Sarbaria) ganesa, Nicéville, *Gazetteer of Sikkim* p. 172, n. 474 (1894) (Sikkim; throughout the warm months at low elevations).

The forewing of my smallest specimen has a length of 47 mm., that of my largest 65 mm. The cottony stripes of the *male* vary as in *P. polyctor*; one of my Sikkim specimens has only one stripe well developed and a second feebly indicated. The variation of the red submarginal spots of the upperside of the hindwings as in *P. polyctor*.

Hab. Assam (7 ♂); Sikkim (10 ♂, 5 ♀); Eastern Nepal; Tonkin.

XXIV. PARIS-GROUP.

Male without woolly streaks on the forewings. Both sexes with a large bluish green patch on the hindwings.

144. ***Papilio arcturus*** Westw. [♂, ♀].

Papilio arcturus Westwood, *Ann. Mag. N. H.* IX, p. 37 (1842) (Himalaya); id., *Proc. Ent.* 1, p. 101, t. 27 (1843); Doubl. Westw. & Hew., *Cat. Diurn. Lep.* 1, p. 11, n. 47 (1846) (Assam); Gray, *Cat. Lep. Ins. B. M. I.* p. 17, n. 67 (1852) (N. India); id., *List Lep. Ins. B. M. I.* p. 21, n. 71 (1856) (Sylhet); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 108, n. 215 (1857) (Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 323, n. 445 (1864) (Sylhet; Assam; Darjeeling); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Cuisine, *Bull. Soc. Ent. Fr.* p. 64 (1886) (var. *notic.*); Butl., *P. Z. S.* p. 377, n. 84 (1886) (W. India); id., *Ann. Mag. N. H.* (6), 1, p. 295, n. 95 (1888) (N.W. India); Elwes, *Tr. Ent. Soc. Lond.* p. 427, n. 406 (1888) (Sikkim; from 3000 to 9000 feet); Leech, *Bull. from China*, etc. p. 533 (1893) (Central and West China).

Achillides arcturus, Swinhoe, *Tr. Ent. Soc. Lond.* p. 311, n. 374 (1893) (Khasia Hills).

Papilio (Achillides) arcturus, Nicéville, *Gazetteer of Sikkim* p. 172, n. 473 (1894) (Sikkim; found together with *P. krishni* Moore).

The Chinese examples which I have examined differ slightly, but apparently constantly, from the Indian ones in the submarginal band on the upperside of the forewings being shorter, narrower, and less bright green, in the rufous ochraceous marginal spots to the hindwings below being more or less obliterated, and in the marginal internervular fringe of the hindwings being less extended white.

In the *female* the green band of the forewings is of a paler colour than in the *male*, owing to the green scales being intermixed with many creamy buff ones; the red submarginal spots of the upperside of the hindwings are larger than in the other sex.

Hab. Assam; Sikkim (11 ♂, 4 ♀); North-West India (*teste* Butler); Western and Central China (7 ♂).

145. *Papilio krishna* Moore [♂, ♀].

Papilio krishna Moore, Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 108, t. 2a, f. 6 (♂) (1857) (Bhutan; Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 323, n. 411 (1864); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Oberth., *Et. d'Ent.* IV, p. 39, n. 27 (1879); Stauding. & Schatz, *Exot. Schmett.* I, p. 8 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 427, n. 405 (1888) (Sikkim; a common species in some seasons at certain places, and found from 3000 up to 8000 or 9000 feet; May to August).

Papilio (Achillides) krishna, Nicéville, *Gazetteer of Sikkim* p. 171, n. 472 (1891) (Sikkim; May to August, 3000 to 9000 feet, not uncommon; "also in W. China" *loc. err.*?).

The female is rather larger than the male, otherwise it is scarcely different from that sex.

Hab. Bhutan; Sikkim (10 ♂, 1 ♀); Assam (1 ♂).

146. *Papilio paris* L. [♂, ♀].

Knorr, *Del. Nat.* l. c. 3, f. 1 (1752).

Papilio Eques Trojonus paris Linné, *Syst. Nat.* ed. x, p. 459, n. 3 (1758) (Asia); Clerck, *Icon. Ins.* I, t. 13, f. 1 (1759); Linné, *Mus. Lud. Ulr.* p. 184, n. 3 (1764) (Ind. or.); id., *Syst. Nat.* ed. xii, p. 745, n. 3 (1767); Houtt., *Naturl. Hist.* I, 11, p. 191, n. 3 (1767); Drury, *Illustr. Nat. Hist.* I, p. 23, t. 12, f. 1, 2 (1773) (China); Müller, *Naturs.* V, 1, p. 566, n. 3 (1774); Fabr., *Syst. Ent.* p. 442, n. 1 (1775); Cramer, *Pap. Ez.* II, p. 9, t. 103, f. A, B (1779) (China); Goeze, *Ent. Beytr.* III, 1, p. 30, n. 3 (1779); Fabr., *Spec. Ins.* II, p. 1, n. 1 (1781); Esper, *Aust. Schmett.* p. 17, n. 3, t. 2, f. 1 (1784); Jablonsky, *Naturs. Schmett.* II, p. 151, n. 37, t. 14, f. 1, 2 (1784); Gmelin, *Syst. Nat.* I, 5, p. 2226, n. 2 (1790); Fabr., *Ent. Syst.* III, 1, p. 1, n. 1 (1793).

Papilio Eques Trojonus paris, Fabricius, *Mant. Ins.* II, p. 1, n. 1 (1787).

Papilio paris, Donovan, *Ins. of China* t. 22 (1798); Godart, *Enc. Méth.* IX, p. 67, n. 116 (♂, *new* ♂) (1819) (China); Boisd., *Spec. Gén. Lép.* I, p. 208, n. 22 (1836) (China); Blanchard, *Hist. Nat. Ins.* III, p. 421, n. 3 (1841); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 11, n. 52 (1816) (N. India; China); *Cat. Lep. Ins. B. M. I.* p. 17, n. 68 (1852) (China; N. India); id., *List Lep. Ins. B. M. I.* p. 21, n. 72 (1856) (Nepaul; Sylhet; Hong-Kong); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 107, n. 213 (1857) (Cherra Punji; Darjeeling); Vollenhov. *Tijdschr. v. Ent.* III, p. 73, n. 25 (1860) (China); Feld., *Verh. z. b. Ges. Wien* p. 323, n. 443 (1864) (E. China; N. India; *see* Canara); Reak., *Proc. Ent. Soc. Phil.* p. 459, n. 9 (1864) ("Philippines" *loc. err.*); Moore, *P. Z. S.* p. 757 (1865); Butl., *Cat. Lep. Ins. descr. Fabric.* p. 255, n. 70 (1869); Oberth., *Et. d'Ent.* IV, p. 40, n. 31 (1879) (China); Aurivill., *Kongl. Sc. Vet. Ak. Handl.* XIX, 5, p. 9, n. 3 (1882) (Recensio Lep. Mus. Lud. Ulr.); Butl., *Ann. Mag. N. H.* (5), XVI, p. 344, n. 112 (1885); Holland, *Tr. Amer. Ent. Soc.* XIV, p. 123, n. 79 (1887) (Hainan); Elwes, *Tr. Ent. Soc. Lond.* p. 427, n. 404 (1888) (Sikkim; the commonest of the green *Papilios*, up to 5000 feet); Manders, *Tr. Ent. Soc. Lond.* p. 535, n. 189 (1890) (Shan States; very common, not found above 5000 feet); Watson, *Journ. As. Soc. Beng.* p. 54 (1891) (Chin-Lushai); Lecch, *Bull. from China*, etc. p. 535 (1893) (*p.p.*); Oberth., *Et. d'Ent.* XVII, p. 4 (1893) (Tonkin).

Achillides paris, Hubner, *Verz. bek. Schm.* p. 85, n. 874 (1816); Swinh., *Tr. Ent. Soc. Lond.* p. 312, n. 375 (1893) (Khasia Hills).

Papilio (Achillides) paris, Doherty, *Journ. As. Soc. Beng.* p. 136, n. 228 (1886) (Kumaon); Nicéville, *Gazetteer of Sikkim* p. 171, n. 471 (1894) (Sikkim; very common up to 5000 feet throughout the year, except the three coldest months).

Papilio (Harimala) paris, Wood-Mason & Nicéville, *ibid.* p. 377, n. 193 (1886) (Cachar); Elwes & Nicéville, *ibid.* p. 437, n. 139 (1886) (Tavoy).

The range of this *Papilio* comprises the whole of Continental India, except the extreme North-West, and Western, Central, and Eastern China, Tonkin, Siam, and Malacca. In the Andaman Islands, the Nicobars, and in Ceylon *Papilio paris* does not occur. The greater Sunda Islands are inhabited by a closely allied species, *P. arjuna* Horsf.

I distinguish three geographical races of *P. paris* L., namely:—

(a) *P. paris* L. from Continental India, Siam, Malacca, Tonkin, and East China;

- (b): *P. paris chinensis* subsp. nov. from Western China (and probably Thibet);
 (c): *P. paris tamilana* Moore from South India.

These subspecies are chiefly different in the size of the blue patch of the hindwings, which is smallest in *chinensis* and largest in *tamilana*.

(a): **P. paris** L., forma typ. [♂, ♀].

Though Linné's description fits to each of the above-named geographical forms of *P. paris*, the typical *paris* is unquestionably the form from Continental India, as the habitat "India or." and the reference to Knorr's figure prove.

That part of the bluish green patch of the hindwings which is situated between the lower discoidal and the upper median veins is trapeziform; at the upper median nervule it has a length of at least 5 mm. The bluish green patch itself extends into the end of the cell, or touches at least the discocellular nervules; it is connected with the abdominal margin by means of a bluish green line, which seems to be always continuous in the *male* sex, and is sometimes obsolete between the median nervules in the *female*. The green macular line of the forewings is extremely variable in length. The whitish area in the outer half of the forewings beneath is occasionally much narrower than usual, but is apparently always broader than in typical *P. paris tamilana* Moore.

Hab. Sikkim (12 ♂, 6 ♀); Assam (3 ♂); Nepal; Burma (2 ♂); Shan States (2 ♂); Tenasserim; Malacca (Thaiping; 1 ♂); Tonkin; East China (1 ♂).

The single *male* from Thaiping I have is remarkable for the hindwings having above, besides the red ring at the anal angle, a transverse submarginal red line between the lower median nervules inside the green submarginal, spotlike scaling, and a similar linear spot before the upper median vein.

(b): **P. paris chinensis** subsp. nov. [♂, ♀].

Papilio paris, Leech (*acc* Linné, 1758), *Bull. from China*, etc. p. 535 (1893) (exceedingly common in W. China).

This form comes very close to typical *paris*; the patch of the hindwings, however, which is smaller, is of an obviously deeper blue colour, and seldom reaches the discocellular nervules; the spot between the second discoidal and the upper median nervules is much smaller than in *paris* and of a triangular form, being almost restricted to a point at the upper median vein.

The bluish green line connecting the patch of the hindwings with the abdominal margin is mostly discontinuous; the first (postcostal) spot of that patch is often absent, as in many individuals of *P. paris*.

Hab. Western China (22 ♂, 2 ♀) and probably Thibet.

(c): **P. paris tamilana** Moore [♂, ♀].

Papilio paris var., Horsfield & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 107. sub n. 213 (1857) (Canara).

Papilio tamilana Moore, *Tr. Ent. Soc. Lond.* p. 313 (1881) (Malabar).

Papilio (Achillides) tamilana, Hampson, *Journ. As. Soc. Beng.* p. 364. n. 205 (1888) (Nilgiri Hills, 3000 to 7000 feet, April to June).

Whitish submarginal streak on the underside of the forewings much shorter than in *P. paris* L. Bluish green patch of the hindwings enlarged; the spot between the upper and middle median veins is about as large as the spot between the upper median and second discoidal nervules in *P. paris*.

In one of my two *females* the green band on the forewings is short, but very broad between the inner margin of the wing and the lower median nervule. The

white marginal spots of the hindwings above are large in both specimens; below they are still larger and of a buffish colour; the submarginal red lunules are also large, and all joined to the marginal spots.

Hab. South India: Canara (6 ♂, 1 ♀), Malabar (2 ♂, 1 ♀), Nilgiri Hills.

147. **Papilio arjuna** Horsf. [♂, ♀, larva, pupa].

Papilio paris, Zinken (*acc* Linné, 1758), *Nov. Act. Ac. Nat. Cur.* XV, p. 112 (1832) (*synon. excl.*: Java).
Papilio arjuna Horsfield, *Cat. Lep. Ins. Mus. E. I. C. I.* t. 1, f. 14, 14a, t. 1, f. 11, 11a (*l., p.*) 12b c (1828) (Java); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 11, n. 53 (1816) (Java); Gray, *Cat. Lep. Ins. B. M. I.* p. 17, n. 69 (1852) (Java); *id.*, *List Lep. Ins. B. M. I.* p. 21, n. 73 (1856) (Java); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 107, n. 242, t. 3, f. 7, 7a (*l., p.*) (1857) (Java); Vollenhov., *Tijdsche. v. Ent.* III, p. 74, n. 26 (1863) (Java); Feld., *Verh. z. b. Ges. Wien* p. 323, n. 411 (1864) (Java); Reak., *Tr. Ent. Soc. Phil.* p. 460, n. 10 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV, p. 46, n. 42 (1865) (Java; *acc* Sumatra, *acc* Borneo); Oberth., *Et. d'Ent.* IV, p. 40, n. 30 (1879) (Java); Hagen, *Iris* VII, p. 26, n. 28 (1894) (Sumatra).
Papilio arjuna var. *tenggerensis* Fruhstorfer, *Ent. Nachr.* p. 286 (1893) (Mt. Tengger, Java, 5000 feet); *id.*, *Stett. Ent. Zeit.* LV, p. 119, t. 3, f. 1 (♂) (1894).

This is the representative species of *P. paris* L. in the greater Sunda Islands. There are three local forms known:—

(a): **P. arjuna** Horsf., forma typ. [♂, ♀, *l., p.*].

The green line of the forewings is a little too broad in Horsfield's figure; it is mostly very thin and gradually disappears anteriorly. The blue patch of the hindwings is variable in size, being sometimes extended into the cell, often not; occasionally it occupies about a quarter of the cell. The submarginal spots of the underside of the hindwings are also variable; their reddish colour is liable to obliteration.

Hab. East Java (5 ♂).

According to Fruhstorfer (*l.c.*) this race with the band on the forewings is confined to Eastern Java, but Hagen (*l.c.*) says that one of his Sumatra specimens has a band.

(b): **P. arjuna karna** Feld. [♂, ♀].

Papilio arjuna, Boisduval (*acc* Horsfield, 1828), *Spec. Gén. Lep.* I, p. 209, n. 23 (1836) (Java).
Papilio karna Felder, *Verh. z. b. Ges. Wien* p. 323, n. 412 (1864) (Java; *nom. nud.*); *id.*, *Reise Novara, Lep.* I, p. 125, n. 93 (1865) (Java).
Papilio arjuna, Wallace, *Tr. Linn. Soc. Lond.* XXV, p. 46, sub n. 42 (1865) (Sumatra).
Papilio discordia Nicéville, *Journ. Bombay N. H. Soc.* p. 343, t. 1, f. 2 (♂) (1892) (Sumatra; "*P. discordia*" in text).
Papilio arjuna var. *karna*, Hagen, *Iris* VII, p. 27, n. 29 (1894) (Sumatra).

Larger than *P. arjuna*; the patch of the hindwings is less convex interiorly, the anal ocellus is larger, and the red colour of some of the submarginal spots of the hindwings below is reduced in extent; the blue lunules are conspicuous. Forewings without band.

I cannot see that there is any difference between Felder's type and Sumatran specimens important enough to be noted, so that Nicéville's *discordia* must sink as a synonym.

(a²): ab. *goleensis* Fruhst.

Papilio arjuna var. *goleensis* Fruhstorfer, *Ent. Nachr.* p. 285 (1893) (Java); *id.*, *Stett. Ent. Zeit.* LV, p. 118 (1894) (Mt. Gede, W. Java, 4000 to 5000 feet).

This aberration is much smaller than *karna*, and differs from *arjuna* Horsf. only in the absence of the band from the forewings.

Hab. Western Java (12 ♂, 2 ♀); Sumatra (2 ♂).

(c): *P. arjuna carnatus* subsp. nov. [♂, ♀].

Papilio arjuna var., Gray, *Cat. Lep. Ins. B. M.* I. p. 17. sub n. 69 (1852) (Borneo); id., *List Lep. Ins. B. M.* I. p. 21. sub n. 73 (1856) (Borneo).

Papilio arjuna, Wallace (*av* Horsfield, 1828), *Tr. Linn. Soc. Lond.* XXV. p. 46. sub n. 12 (1865) (Borneo).

Larger than *P. arjuna karna* Feld.; costal margin of the forewings more arched; anal ocellus of the hindwings as large as, or larger than, in *karna*, but its black centre smaller; submarginal green spots in the posterior region of the hindwings larger. Beneath, the whitish internervular streaks of the forewings are purer white and better defined, owing to the whitish scaling being denser; the first and the two last orange spots of the hindwings large, the others more or less obliterated, that between the first and second median nervules usually wanting; all the violet-blue lunules much pronounced. In the *female* the costal orange mark of the underside of the hindwings is also present above.

Hab. Borneo (5 ♂, 6 ♀).

148. *Papilio prillwitzii* Fruhst. [♂].

Papilio prillwitzii Fruhstorfer, *Ent. Nachr.* p. 225 (1893) (Java).

This remarkable species (or a sport only?), of which Mr. Fruhstorfer lent me a photograph, is most readily distinguished from the allied species by the enlarged submarginal spots to the underside of the hindwings; the spot between the upper discoidal veins measures about 5 mm. square.

Hab. Mount Gede, W. Java, 4000 feet (one specimen known).

XXV. PALINURUS-GROUP.

Male with or without hairy stripes on the forewings. Both sexes with a broad green band across the wings. Hindwings below with a series of tricolorous submarginal spots.

149. *Papilio palinurus* Fabr. [♂, ♀].

♀. *Papilio Eques Trujanus palinurus* Fabricius, *Mont. Ins.* II. p. 2. n. 10 (1787) ("Habitat. Tranquebariae, Dow. Linn."); Gmelin, *Syst. Nat.* I. 5. p. 2227. n. 278 (1790); Fabr., *Ent. Syst.* III. I. p. 5. n. 12 (1793).

♀. *Papilio Eques Achirus regulus* Stoll, *Cram. Pap. Evot. Suppl.* p. 175. t. 41. f. 1. 1x (1790) (Bengal?).

♀. *Laertius regulus*, Hübner, *Verz. bek. Schmett.* p. 84. n. 860 (1816).

♀. *Papilio palinurus*, Godart, *Enc. Méth.* IX. p. 66. n. 112 (1819); Boisd., *Spec. Gén. Léop.* I. p. 207. n. 21 (1836); De Haan, *Verh. Nat. Gesch. Ned. oerz. bez.* p. 28. t. 7. f. 3 (1840) (Padang); Doubl. Westw. & Hew., *Gén. Diurn. Léop.* I. p. 11. n. 51 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 17. n. 70 (1852) (*p.p.*); id., *List Lep. Ins. B. M.* I. p. 21. n. 74 (1856) (*p.p.*); Vollenhov. *Tijdschr. v. Ent.* III. p. 73. n. 24 (1860) (Padang); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 440 (1864) ("Bengalia," "Tranquebar" *ex err.*); Butler, *Cat. Diurn. Lep. Fabae*, p. 255. n. 69 (1869) (*p.p.*); *see* Coimbatore, S. India, *spec. alt. seilivet P. buddha* Westw.).

Papilio crino, Godart (*see* Fabricius, 1793), *Enc. Méth.* IX. p. 66. n. 113 (1819) (*p.p.*).

♂ ♀. *Papilio brama* Guérin, *Rev. Zool.* 43. t. 1. f. 3. 4 (1840) (Malacca); id., in Deless., *Sour. Voy. Ind.* II. p. 71 (1843); Gray, *Cat. Lep. Ins. B. M.* I. p. 18. n. 71 (1852) (India); id., *List Lep. Ins. B. M.* I. p. 22. n. 75 (1856) ("Assam" *loc. err.*); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 439 (1864) (Malacca); Penang; Sumatra; "Assam" *loc. err.*; Wall., *Tr. Linn. Soc. Lond.* XXV. p. 46. n. 39 (1865) (Malacca; Sumatra); Druce, *P. Z. S.* p. 357. n. 15 (1873) (Borneo); Dist., *Rhop. Ind.* p. 338. n. 6. t. 32. f. 4 (♂) (1885) (Mal. Pen.); Hagen, *Leis* VII. p. 26. n. 27 (1894) (Sumatra; Serdang, not rare).

♂ ♀. *Papilio palinurus*, Oberthur, *Et. d'Ent.* IV. p. 107. n. 34 & p. 112. n. 34 (1879) (Penang; Sumatra; "Celebes" *loc. err.*).

Judging from the habitat "Tranquebar" of Fabricius's *palinurus*, one is led to suppose that this Fabrician species might be identical with the South Indian insect which Westwood described as *P. buddha*. In the museum in Copenhagen there is, however, a specimen of "*palinurus*" Fabr. out of the Lund collection preserved which most probably is the Fabrician type, as Fabricius described the species from that collection. A photograph of the specimen which I received through the kindness of Dr. Meinert proves its being identical with Guérin's *P. brama*; the same opinion was expressed to me by Prof. Chr. Aurivillius, who had examined the specimen in Copenhagen.

P. E. A. regulus Stoll is the same as *palinurus* Fabr., and also the same sex, according to the position of the band of the forewings.

This *Papilio* inhabits the Malay Peninsula, the greater Sunda Islands, and the Philippines, and must be divided into three local forms:—

(a): *P. palinurus* Fabr. from Malay Peninsula, Sumatra, Borneo;

(b): *P. palinurus angustatus* Stauding. from Palawan;

(c): *P. palinurus daedalus* Feld. from the Philippine Islands.

(a): **P. palinurus** Fabr., forma typ. [♂, ♀].

The dark basal area of the underside of the forewings is mostly limited in an even curve. The marginal pale area of the hindwings below occupies scarcely more than a third of the way from the outer margin to the cell. The submarginal yellow spots on the underside of the hindwings are much shaded with black in many Bornean examples; those between the median nervules are sometimes obsolete.

The greenish blue band of the hindwings varies in breadth in both sexes; it either enters the cell or does not.

Hab. Malay Peninsula (2 ♂, 2 ♀); Sumatra (5 ♂); Borneo (5 ♂); Banguey Island (1 ♂).

(b): **P. palinurus angustatus** Stauding. [♂, ♀].

♂ ♀. *Papilio daedalus* var. *angustatus* Staudinger, *Iris* 1. p. 273 (1888) (Palawan); id., *loc. cit.* II. p. 12 (1889) (Palawan).

♂ ♀. *Papilio (Harimala) daedalus*, Semper, *Philipp., Tagfalt.* p. 278. n. 405 (1892) (*p.p.*).

Differs from *P. palinurus* Fabr. in the outer border of the dark area on the underside of the forewings being more or less straight between the median branches, in the pale marginal area of the same side of the hindwings being broader, and in the black band between the greenish blue discal band and the submarginal bluish green markings on the upperside of the hindwings being less dusted with green scales, and therefore appearing broader black.

Hab. Palawan (3 ♂, 3 ♀).

(c): **P. palinurus daedalus** Feld. [♂, ♀].

(?) ♂. *Papilio palinurus*, Guérin (*nec* Fabricius, 1787), *Rev. Zool.* p. 44. t. 1. f. 2 (1840).

Papilio palinurus, Gray, *List Lep. Ins. B. M.* 1. p. 21. n. 74 (1856) (Philippine Is.)

♂. *Papilio daedalus* Felder, *Wien. Ent. Mon.* V. p. 298. n. 3 (1861) (Luzon); id., *Reise Novara, Lep.* 1. p. 123. n. 92. t. 18. f. b (♂) (1865); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 46. n. 40 (1865); Westw., *Tr. Ent. Soc. Lond.* p. 90. n. 3 (1872).

♂. *Papilio palinurus*, Reakirt, *Pr. Ent. Soc. Phil.* p. 463. n. 12 (1864) (*syn. p.p.*).

♂ ♀. *Papilio daedalus*, Obertlhür, *Et. d'Ent.* IV. p. 40. n. 33 (1879) (Mindanao).

♂ ♀. *Papilio (Harimala) daedalus*, Semper, *Philipp., Tagfalt.* p. 278. n. 405 (1892) (*p.p.*: occurs all over the Philippines).

The greenish blue band of the wings is broader than in *angustatus*, with which the present form agrees in other respects.

Hab. Philippine Islands (10 ♂, 1 ♀).

150. *Papilio buddha* Westw. [♂, ♀].

Papilio palinurus, Butler (*see* Fabricius, 1775), *Cat. Diurn. Lep. descr. Fabric.* p. 255. n. 69 (1869) (*synon. excl.*; Coimbatore, South India).

Papilio buddha Westwood, *Tr. Ent. Soc. Lond.* p. 86. t. 3. f. 1 (♂) (1872) (*patria?*): Butl., *P. Z. S.* p. 612. n. 49 (1881) (Nilgiri Hills).

Papilio (Harimala) buddha, Hampson, *Journ. As. Soc. Beng.* p. 364. n. 204 (1888) (Nilgiri Hills: confined to the western slopes, where it is not uncommon).

The *female* of this species does not differ so much from the *male* as in the allied species; the band of the wings is often not narrower than in the other sex; on the hindwings above there stands a yellow spot behind the subcostal nervule which is seldom clearly marked in the *male*.

Hab. South India (5 ♂, 2 ♀)

151. *Papilio crino* Fabr. [♂, ♀, larva].

Papilio Eques Trojans crino Fabricius, *Ent. Syst.* III. 1. p. 5. n. 13 (1793) ("Africa" *loc. err.*).

Papilio crino, Donovan, *Ins. of China* t. 23 (1798); Godart, *Enc. Méth.* IX. p. 66. n. 113 (1819) (*p.p.*); Boisd., *Spéc. Gén. Léop.* I. p. 207. n. 20 (1836) (*synon. ex p.*; "Cochin China" *loc. err.*); Guér., *Rev. Zool.* p. 43. t. 1. f. 1 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 50 (1846) (Ceylon; "Cochin China" *loc. err.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 18. n. 73 (1852) (Ceylon); id., *List Lep. Ins. B. M.* I. p. 22. n. 77 (1856) (Ceylon); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 109. n. 218 (1857) (Ceylon); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 437 (1864) (Ceylon; "Cochin China" *loc. err.*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 255. n. 68 (1869) (Ceylon); Westw., *Tr. Ent. Soc. Lond.* p. 88 (1872); Oberth., *Et. d'Ent.* IV. p. 40. n. 35 (1879) ("Inde"); Betham, *Journ. Bomb. N. H. Soc.* p. 325 (1891) (Central Provinces).

Harimala montanus, Moore, *Lep. of Ceylon* I. p. 146. t. 61. f. 1 (♀) (1881) (Ceylon; short descr. of larva; "*Harimala*" gen. nov.).

Papilio (Harimala) crino, Nicéville, *Journ. As. Soc. Beng.* p. 51. n. 127 (1885) (Calcutta); Hampson, *Journ. As. Soc. Beng.* p. 364. n. 203 (1888) (Nilgiri Hills; 1000 to 3000 feet).

This species has like *P. blumei* Boisd. the upperside of the tails not unicolorous, but sprinkled with green scales. The forewings of the *male* have often woolly nervular stripes.

(a²): ♂-ab. *montanus* Feld.

Papilio crino var. *montanus* Felder, *Verh. z. b. Ges. Wien* p. 322. sub n. 437. & p. 370. n. 262 (1864) (Rambodde, Ceylon).

I must restrict this aberrational name to the *males* without woolly stripes on the forewings; the other character which Felder mentions, namely the greater breadth of the band on the hindwings, is very unimportant, and does not apply to all *males* without hairy stripes. Notwithstanding that Felder says that his specimens from Rambodde are devoid of the hairy streaks, I find that some of Felder's examples from that place have the stripes obviously developed.

The specimens from the more northern parts of the range of *crino* seem to me to have the band of the hindwings rather broader than the Ceylon examples.

The aberration *montanus* occurs all over the area of *crino*.

Hab. South India (5 ♂); Ceylon (6 ♂, 3 ♀); Bengal; Central Provinces.

152. *Papilio blumei* Boisdu. [♂, ♀].

- Papilio blumei* Boisduval, *Spec. Gén. Léop.* I. p. 206. n. 19 (1836) ("Amboina" *loc. err.*)
 De Haan, *Verh. Nat. Gesch. Ned. orerz. bez.* p. 29 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 49 (1846); Gray, *Cat. Lep. Ins. B. M. I.* p. 18. n. 72 (1852); id., *List Lep. Ins. B. M. I.* p. 22. n. 76 (1856); Felder, *Verh. z. b. Ges. Wien* p. 322. n. 136 (1864) (Celebes); id., *Reise Novara, Lep.* I. p. 122. n. 91. t. 18. f. a (1865) (Celebes); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 46. n. 41. t. 6. f. 4 (1865) (Celebes); Hopff., *Stett. Ent. Zeit.* p. 20. n. 17 (1874) (Celebes); Oberthür, *Et. d'Ent.* IV. p. 40. n. 36. & p. 112. n. 36 (1879) ("Banda, Ceram, Borneo" *loc. err.*); Standing, & Schatz, *Exot. Schmett.* I. p. 8 (1884) (Celebes); Westw., *Tr. Ent. Soc. Lond.* p. 167. n. 1 (1888) (N. Celebes, April); Holland, *Proc. Boston N. H. Soc.* XXV. p. 77. n. 131 (1890) (S. Celebes).
- ♂ ♀. *Papilio blumei*, Rothschild, *Iris* V. p. 442 (1892) (S.E. Celebes).

♂. The band of the forewings extends mostly a little beyond the apex of the discoidal cell; in some specimens it reaches only from the origin of the lower median nervule to the upper median branch; the black band outside the green one is also very variable in breadth. The woolly stripes upon the second and third median nervules are sometimes very much reduced. On the hindwings above there is sometimes a yellowish linear spot at the anal angle. The lunules bordering the submarginal spots on the underside of the hindwings are sometimes much more blue than usual; the posterior of those yellowish submarginal spots are rather small in one of my examples.

♀. Differs from the *male* especially in the inferior breadth of the band and in the paler ground-colour; the band is narrowest within the cell of the forewings; in one of my two *females* it crosses the cell close to the discocellular veinlets, while in the other it reaches at the median nervure from the upper median branch to a little more than half the way between the second and third branches.

Hab. Celebes (9 ♂, 2 ♀).

XXVI. PERANTHUS-GROUP.

Woolly stripes on the forewings of the *males* strongly developed. Basal area of wings green. Hindwings below with a series of tricolorous subdiscal spots.

153. *Papilio neumogeni* Honr. [♂].

- ♂. *Papilio neumogeni* Honrath, *Ent. Nachr.* p. 127 (1890) (Sambawa); id., *Berl. Ent. Zeit.* p. 431. t. 15. f. 2 (1891) (Sambawa).
- ♂. *Papilio (Harimula) maremba* Doherty, *Journ. As. Soc. Beng.* p. 192. n. 111 (1891) (Sumba: rare near the coast, commoner in the remote interior).
- ♂. *Papilio maremba*, Oberthür, *Et. d'Ent.* XIX. p. 2. t. 3. f. 12 (1891) (Sumba).

This remarkable insect differs from the species of the *patinurus*-group especially in the large hairy patch on the disc of the forewings of the *male*, and in the hindwings having below a series of subdiscal tricolorous spots (bluish, black, yellow), as in the other species of the *peranthus*-group.

In Oberthür's figure the tails bear some green scales; Doherty and Honrath say, however, that the tail is not green.

Hab. Sambawa and Sumba.

154. *Papilio peranthus* Fabr. [♂, ♀].

- Papilio Eques Trajanus peranthus* Fabricius, *Mant. Ins.* II. p. 4. n. 33 (1787) ("Cochin China Mus. Dom. Banks"); Gmelin, *Syst. Nat.* I. 5. p. 2232. n. 292 (1790); Fabr., *Ent. Syst.* III. 1. p. 15. n. 44 (1793).

Papilio peranthus, Donovan, *Ins. of China* t. 25 (1798) ("Canton" *loc. err.*); Godart, *Éur. Méth.* XI. p. 66. n. 111 (1819) (Java; "Cochin China" *loc. err.*); Lucas, *Lep. Escot.* p. 22. t. 12. f. 2 (1835) (Java; "Cochin China" *loc. err.*); Boisli., *Spec. Gén. Lép.* I. p. 293. n. 16 (1835) (Java; "Borneo" *loc. err.*; *see vars. A. B.*); De Haan, *Verh. Nat. Gesch. Nid. overz. bez.* p. 27 (1846) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 11. n. 44 (1846) (Java; "Borneo" *loc. err.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 16. n. 63 (1852) (Java); *id.*, *List Lep. Ins. B. M.* I. p. 20. n. 67 (1856) (Java); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 109. n. 219 (1857) (Java); Vollenhov., *Tijdschr. v. Ent.* III. p. 73. n. 22 (1860) (*p.p.*; Java, *see Timor*); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 434 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 45. n. 35 (1865) (Java; *see Lombok*); Butl., *Cat. Diurn. Lep. descr. Fabric.* p. 255. n. 67 (1869) (Java); Oberth., *Et. d'Ent.* IV. p. 40. n. 37 (1879) (Java); Standing. & Schatz, *Écot. Schmelt.* I. p. 8 (1884); Haase, *Untersuch. üb. Min.* p. 51 (1893) (Java; "Cochin China" *loc. err.*).

The type-specimen of this species is still preserved in the Banksian collection.

P. peranthus occurs in Java, on the lesser Sunda Islands as far east as Adonara, and on the small islands south of Celebes and Saleyer. In Celebes, Timor, Timor Laut, the Moluccas, and New Guinea it is represented by other, but closely allied species.

At present there are three local forms of *P. peranthus* Fabr. known, namely:—

(a): *P. peranthus* Fabr. from Java;

(b): *P. peranthus intermedius* Snellen from Tanah-Djanpea;

(c): *P. peranthus fulgens* Röber from Bonerate, Lombok, Sambawa, Sumba, Flores, Pura, Adonara.

The *P. pericles* Wall. from Timor, Wetter, and the Tenimber Islands is apparently constantly different from *P. peranthus* in the much greater extent of the greenish blue colour of the forewings; and it is very remarkable to note that *P. peranthus fulgens*, which geographically stands intermediate between *peranthus* and *pericles*, has the bluish green area more restricted than typical *peranthus* has. As the green-blue area of the wings is not constant either in *peranthus* or *pericles*, it is probable that further researches on the lesser Sunda Islands will procure material which links the two species together. I have already two specimens without proper locality which are almost as blue as *pericles*, and have the greenish blue area more extended than *peranthus* has, but much less than *pericles*; the cottony patches on the forewings of these two examples resemble more those of *pericles* than of *peranthus*, consisting of three separate stripes. I refer for the present the two specimens to *P. peranthus intermedius* Snellen, to which they come very near, according to P. C. T. Snellen who has kindly examined them.

The Celebesian *P. adamantius* Feld., as well as the Moluccan *P. lorquinianus* Feld., are not connected by any intergradations with *P. peranthus* Fabr., and differ much more from that species than *P. pericles* Wall. does, so that I do not hesitate to enumerate them as distinct species.

(a): **P. peranthus** Fabr., forma typ. [♂, ♀].

The bluish green area of the forewings, which in some examples is more blue than in others, extends about to the origin of the first median nervule. The cottony patch on the forewings of the *male* consists of four streaks which are entirely, or almost entirely, merged together, and of a separate narrow streak upon the upper median vein.

Hab. Java (5 ♂, 1 ♀).

(b): **P. peranthus intermedius** Snellen [♂].

♂. *Papilio peranthus* var. *intermedius* Snellen, *Tijdschr. v. Ent.* XXXIII. p. 275 (1890) (Tanah-Djanpea).

Differs from *peranthus* in the more bluish colour of the wings.

Suellen calls this aberration a remarkable transition to "Boisduval's var. B (*adamanthus* Feld.)." I do not see how this can be, as *intermedius* agrees, according to Suellen, with *peranthus* in shape and size, and is distinguished from that Javan insect only by the (variable) tint of the bluish green area of the wings.

Hab. Island of Tanah-Djaunpea (south-east of Saleyer). Two specimens without locality in my collection.

(c): **P. peranthus fulgens** Röber [♂, ♀].

Papilio peranthus, Felder (*nee* Fabricius, 1787), *Verh. z. b. Ges. Wien* p. 322. n. 434 (1864) (*p.p.*: Lombok); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 45. n. 35 (1865) (*p.p.*: Lombok); Suellen, *Tijdschr. v. Ent.* XXXIV. p. 251. n. 49 (1891) (Flores).

Papilio (Harinala) peranthus var., Doherty, *Journ. As. Soc. Beng.* p. 193 (1891) (Sambawa).

♂. *Papilio peranthus* var. *fulgens* Röber, *Tijdschr. v. Ent.* XXXIV. p. 274 (1891) (Bonerate).

The bluish green area of the forewings extends in Röber's type as far as the origin of the second median nervule, as it does in the specimens from Sambawa, Flores, etc.

The size of the subapical green band of the forewings, by which Röber differentiates this form from typical *peranthus*, is extremely variable; in the *female*, which does not remarkably differ in pattern from the *male*, this band is less green than in the other sex.

Hab. Bonerate; Lombok (1 ♂); Sambawa (W. Doherty, September 1891) (15 ♂, 5 ♀); Flores; Pura (W. Doherty, October 1891) (1 ♀); Adonara (W. Doherty, November 1891) (1 ♂).

155. **Papilio pericles** Wall. [♂, ♀].

Papilio peranthus, De Haan (*nee* Fabricius, 1787), *Verh. Nat. Gesch. Ned. overz. bez.* p. 28 (1840) (Timor); Vollenhov., *Tijdschr. v. Ent.* III. p. 73. n. 22 (1860) (*p.p.*: Timor); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 434 (1864) (*p.p.*: Timor).

♂. *Papilio pericles* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 45. n. 36. t. 6. f. 1 (1865) (Timor).

♀. *Papilio pericles*, Oberthür, *Et. d'Ent.* IV. p. 40. n. 38 (1879) (Timor).

♂. The greenish blue area of the forewings extends beyond the apex of the cell, and reaches sometimes a little farther than the junction of the fourth and fifth subcostal nervules; in other examples it is more reduced, just reaching the very base of the second discoidal vein. The green subapical band of *P. peranthus* Fabr. is here represented by a few bluish or buffish scales at the apex of the wing. Most specimens have four cottony stripes—one each upon the two lower median nervules and the submedian nervule, and one between the submedian and third median vein; the three posterior stripes are mostly merged together; in many individuals the last or the last but one, or both, are wanting, so that in certain examples there are only two small patches standing upon the two lower median nervules. Upon the di-cocellular veinlets there stands mostly a conspicuous black spot.

Below, the specimens are especially variable in the size and distinctness of the tricolorous subdiscal spots of the hindwings.

♀. This sex is rather more purple-blue than the *male* in certain lights, and the blue area is a little less extended, reaching in one of my two specimens just to the di-cocellular veins on the forewings, while in the other it extends a little beyond the apex of the cell.

Hab. Timor (W. Doherty: Oinauisa, November to December 1891; Dili, May 1892) (15 ♂, 1 ♀); Wetter (W. Doherty, May 1892) (6 ♂, 1 ♀); Tenimber (W. Doherty, June to July 1892) (2 ♂).

The Wetter and Tenimber (Sjerra) specimens do not differ from the Timor individuals.

156. *Papilio lorquinianus* Feld. [♂, ♀].

♂. *Papilio lorquinianus* Felder, *Reise Novara, Lep.* I. p. 119. n. 89 (1865) (Dodinga).

♂. *Papilio philippus* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 45. n. 37 (1865) (*p.p.*; Batchian); Oberthür, *Et. d'Ent.* IV. p. 41. n. 40 (1879) (Ternate).

♀. *Papilio philippus*, Oberthür, *Ann. Mus. Civ. Genova.* XV. p. 471. n. 7 (1880) (Halmahera; Ternate).

The three subspecies of this species differ from *P. pericles* Wall. especially in the greater size, and in the development of a distinct blue or bluish green scaling in the apical region of the forewings. The New Guinea form, which I know only from Mr. Oberthür's description and figure, is rather different from typical *lorquinianus*, which inhabits the Northern Moluccas; Wallace's typical *philippus* from the Southern Moluccas stands, however, intermediate between the two, and proves that the New Guinean *albertisi* is not specifically distinct.

(a): *P. lorquinianus* Feld., forma typ. [♂, ♀].

♂. While in some specimens the blue area of the forewings reaches only a little beyond the base of the second median nervule, or is extended to the discocellular veinlets, which remain, however, black, or there are blue scales even beyond the apex of the cell. The apical greenish blue band is inconstant in breadth. The cottony stripes on the two lower median and the submedian veins are always confluent with one another, whilst that upon the upper median nervule stands separate.

The pale submarginal triangular band on the underside of the forewings is in some individuals a third narrower than in others; the subdiscal tricolorous spots on the hindwings are always rather large, though they vary considerably in size; the ochraceous lunules especially are often twice as broad as usual.

♀. (Not yet described). Paler than the *male* on either side. The blue area faintly greener and a little less extended than in most *males*; the submarginal greenish blue, feeble, band of the forewings longer, reaching the hinder angle of the wing.

Hab. Halmahera (4 ♂, 1 ♀); Ternate; Batjan (W. Doherty, March 1892) (4 ♂, 1 ♀).

(b): *P. lorquinianus philippus* Wall. [♂].

♂. *Papilio peranthus* var. A, Boisduval, *Spec. Gén. Lep.* I. p. 204. sub n. 16 (1836) (Moluccas); Feld., *Verh. z. b. Ges. Wien* p. 322. sub. n. 434 (1864).

♂. *Papilio philippus* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 45. n. 37. t. 6. f. 3 (♂) (1865) (Moluccas: Ceram, *nec* Batjan).

♂. Larger and somewhat greener (less blue) than *lorquinianus* Feld.; the greenish blue area of the forewings extends some millimetres beyond the apex of the cell, that of the hindwings is also larger than in *lorquinianus*; the hinder angle of the forewings is much less rounded; the hairy streaks are joined only in the middle; and the subdiscal tricolorous spots on the underside of the hindwings are very large.

In my single specimen from Ceram the submarginal band on the forewings consists of six narrow and small bluish green spots; the two posterior hairy streaks are much smaller than in *lorquinianus*; the submarginal spots on the hindwings are bluish green, not greenish blue; and the subdiscal pale band on the forewings beneath is much less triangular, being comparatively narrow anteriorly and broad posteriorly.

♀. Unknown.

Hab. Ceram (1 ♂) (and Amboina? Buru?).

Mr. Ph. Crowley has two *males* of this subspecies, unfortunately without locality. Wallace describes this subspecies from a Ceram and a Batjan specimen. Pointing out the differences between the two examples, of which the latter, of course, belongs to *lorquinianus* Feld., Wallace gives first the characters of the Ceram specimen; as, moreover, Wallace's figure represents the southern form, the name of *philippus* cannot be put as synonym to *lorquinianus* Feld., but must be applied to the Ceramese subspecies. In the explanation of plate 6 Wallace says, by mistake, that the figure represents a *female* from Ceram. Wallace's type is probably lost; the specimen standing as *philippus* Wall. in the Hewitson collection is *lorquinianus* Feld.

(c): *P. lorquinianus albertisi* Oberth. [σ , \varnothing].

σ \varnothing . *Papilio d'albertisi* Oberthür, *Et. d'Ent.* IV. p. 41. n. 39 (1879) (*nom.nud.*; Andai); id., *Ann. Mus. Civ. Genova.* XV. p. 469. n. 6. t. 2. f. 1 (σ) (1880) (Andai).

This form seems to be still greener than *P. lorquinianus philippus* Wall. The bluish green area of the forewings is a little larger than in that subspecies, the submarginal green band is very narrow, the pale subdiscal band on the underside of the forewings is narrower and less distinct, and the subdiscal tricolorous spots on the underside of the hindwings are much smaller than in the Ceramese insect. The posterior of the cottony stripes of the *male* is obliterated.

Hab. Andai, New Guinea.

In the size of the subdiscal spots of the hindwings beneath and in the less developed cottony streaks of the *male* this subspecies approaches *P. pericles* Wall. The Aru and Key Islands are probably inhabited by a form which resembles *P. pericles* Wall. still more.

157. *Papilio adamantius* Feld. [σ].

Papilio peranthus var. B, Boisduval, *Spec. Gén. Léop.* I. p. 204. sub n. 16 (1836) (Celebes).

σ . *Papilio adamantius* Felder, *Verh. z. h. Ges. Wien* p. 322. n. 435 (1864) (*nom.nud.*; Celebes); id., *Reise Novara, Lep.* I. p. 121. n. 90. t. 18. f. c (σ) (1865) (Celebes); Hopff., *Stett. Ent. Zeit.* p. 22. n. 16 (1874) (Celebes); Stauding. & Schatzl., *Exot. Schneitt.* I. p. 8 (1884) (Celebes); Holland, *Proc. Bost. Soc. N. H.* XXV. p. 77. n. 130 (1890) (S. Celebes); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

σ \varnothing . *Papilio unedon* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 46. n. 38. t. 6. f. 2 (σ) (1865) (Macassar; Menado); Oberth., *Et. d'Ent.* IV. p. 41. n. 41 (1879) (Celebes).

Papilio adamantius, Piepers & Snellen, *Tijdschr. v. Ent.* XXI. p. 39. n. 158 (1878) (Bonthain; Mangkassar; Alloe; Bantimocroorg).

The costal margin of the forewings is strongly arched, and the tails are very broad; these are characters which are met with in so many Celebesian representative forms. The greenish blue area of the wings is much more restricted than even in *P. peranthus fulgens* Röber.

In the *male* sex many examples have a woolly streak upon the submedian nervure, besides the streaks upon the lower median nervules, while in other individuals the submedian vein is bare of hairs.

The *female* is unknown to me; it is still undescribed.

Hab. Celebes (16 σ).

XXVII. ULYSSES-GROUP.

Male with cottony patches on the forewings. Basal half or more of the upper-side of the wings blue; hindwings beneath with a series of submarginal spots.

158. *Papilio ulysses* L. [♂, ♀, larva, pupa].

Seba, *Thes.* IV. p. 56. 58. t. 46. f. 9. 10. & t. 47. f. 9. 10. 11. 12 (1765) ("Ind. or.").

- ♂. *Papilio Eques Achirus ulysses* Linné, *Syst. Nat.* ed. x. p. 462. n. 20 (1758) (Asia); Clerck, *Icon. Ins.* II. t. 23. f. 1 (1764); Linné, *Mus. Lud. Utr.* p. 201. n. 20 (1764) ("America merid." *loc. err.*); id., *Syst. Nat.* ed. xii. p. 748. n. 21 (1767) (Asia); Müller, *Naturs.* V. 1. p. 572. n. 21 (1774); Fabr., *Syst. Ent.* p. 450. n. 33 (1775); Cramer, *Pap. Exot.* II. p. 37. t. 121. f. a. b (1779) (Amboina); Goeze, *Ent. Beytr.* III. 1. p. 48. n. 21 (1779); Fabr., *Spec. Ins.* II. p. 13. n. 52 (1781); Blumenb., *Handb.* ed. ii. p. 356. n. 2 (1782) (Amboina); Fabr., *Mont. Ins.* II. p. 7. n. 58 (1787); Jablonsky & Herbst, *Naturs. Schneitt.* III. p. 214. n. 119. t. 51. f. 1. 2 (1788); Gmelin, *Syst. Nat.* I. 5. p. 2236. n. 21 (1790); Fabr., *Ent. Syst.* III. 1. p. 23. n. 67 (1793).
- ♀. *Papilio Eques Achirus diomedes* Linné, *Syst. Nat.* ed. x. p. 462. n. 22 (1758) (India); id., *Mus. Lud. Utr.* p. 203. n. 22 (1764) (India); id., *Syst. Nat.* ed. xii. p. 749. n. 23 (1767); Houtt., *Naturl. Hist.* I. 11. p. 203. n. 22 (1767); Müller, *Naturs.* V. 1. p. 572. n. 23 (1774); Fabr., *Syst. Ent.* p. 450. n. 35 (1775); Cramer, *Pap. Exot.* II. p. 38. t. 122. f. a (1779); Goeze, *Ent. Beytr.* III. 1. p. 49. n. 23 (1779); Fabr., *Spec. Ins.* II. p. 14. n. 54 (1781); id., *Mont. Ins.* II. p. 7. n. 60 (1787); Jablonsky & Herbst, *Naturs. Schneitt.* III. p. 209. n. 117. t. 50. f. 1 (1788); Gmelin, *Syst. Nat.* I. 5. p. 2236. n. 23 (1790); Fabr., *Ent. Syst.* III. 1. p. 23. n. 68 (1793).
- ♂ ♀. *Papilio Eques Achirus ulysses*, Stoll, in Cram., *Pap. Exot.* IV. *Procepe Rang. Lep.* p. 3. note (*) (1782).
- ♂ ♀. *Papilio Eques Achirus ulysses*, Esper, *Aust. Schneitt.* p. 175. n. 79. t. 43. f. 1 (1795). & p. 193. t. 47. f. 1 (1797).
- ♂. *Papilio ulysses*, Donovan, *Ins. of India* t. 21 (1800).
- ♂. *Laertias ulysses*, Hübner, *Verz. bek. Schm.* p. 84. n. 856 (1816).
- ♀. *Laertias diomedes*, Hübner, *l.c.* p. 84. n. 857 (1816).
- ♂ ♀. *Papilio ulysses*, Godart, *Enc. Méth.* IX. p. 65. n. 110 (1819) (noticed gynandromorphous spec.); Lucas, *Lép. Ec.* p. 7. t. 3 (♂) (1835) (Amboina); Boisdu, *Spec. Gén. Lép.* I. p. 202. n. 15 (1836) (Amboina); "Celebes" *loc. err.*; De Haan, *Verh. Nat. Ges. Ned. overz. bez.* p. 27. t. 2. f. 3 (♀) (1840); Doubl. Westw. & Hew., *Gen. Diurna. Lep.* I. p. 10. n. 42 (1846) (Amboina); Lucas, in Chenu's *Enc. d'Hist. Nat., Pap.* p. 35. f. 111. & t. 12 (1851-53); Gray, *Cat. Lep. Ins. B. M.* I. p. 16. n. 61 (1852) ("Ceylon?" *loc. err.*); id., *List Lep. Ins. B. M.* I. p. 19. n. 65 (1856) ("Ceylon?" *loc. err.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 73. n. 21 (1860) (Amboina); "Celebes" *loc. err.*; Feld., *Verh. z. b. Ges. Wien* p. 321. n. 427. & p. 370. n. 256 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 44. n. 31 (1865) (Amboina; Ceram); Butl., *Cat. Diurna. Lep. descr. Fabric.* p. 254. n. 66 (1869); Oberth., *Et. d'Ent.* IV. p. 42. n. 46 (1879) (Amboina; Ceram); Aurivill., *Konigl. Sr. Vet. Ak. Handl.* XIX. 5. p. 24. n. 20. & p. 25. n. 22 (1882); Pagenst., *Jahrb. Nass. Ver. Nat.* p. 203 (1884); Stauding. & Schatz, *Exot. Schneitt.* I. p. 7 (1884); Butl., *Ann. Mag. N. H.* (5). XIII. p. 197. n. 47 (1884) (Amboina); Ribbe, *Iris* II. p. 209 (1891) (Ceram).

This beautiful insect inhabits the Moluccas, New Guinea and the adjacent islands, North Queensland, the Bismarek Archipelago, and the Solomon Islands; in New Caledonia occurs another species (*P. montouzieri* Boisdu.), which is, however, very closely allied to *P. ulysses* L. If we unite the *ulysses* from the Aru Islands, of which I unfortunately could not compare a longer series of specimens, with the New Guinean subspecies, we have seven geographical races of *ulysses* L.:—

- (a) : *P. ulysses* L. from the Southern Moluccas ;
 (b) : *P. ulysses autolyceus* Feld. from New Guinea, Waigeu, Aru Islands ;
 (c) : *P. ulysses jöessa* Butl. from North Queensland ;
 (d) : *P. ulysses telemachus* Montr. from Woodlark Island ;
 (e) : *P. ulysses ambiguus* subsp. nov. from New Britain and New Ireland ;
 (f) : *P. ulysses orsippus* Godm. & Salv. from the Solomon Islands ;
 (g) : *P. ulysses telegonus* Feld. from the Northern Moluccas.

The cottony stripes on the forewings of the *males* are variable in every subspecies, though less so in *telegonus*; they are broadest in *telegonus*, narrowest in certain examples of *autolyceus* and *orsippus*; their size is of no specific value, as can be

seen from two of my specimens of *autolyceus*, in one of which the posterior stripes touch one another, while in the other specimen the inter-spaces are broader than the stripes. The number of the cottony stripes is also individually different: *telegonus* has seven stripes, and mostly there is an eighth indicated upon the fourth subcostal nervule; the other subspecies have six or seven.

(a) : *P. ulysses* L., forma typ. [♂, ♀].

The black round mark within the blue area of the forewings of the female, so much exaggerated in Herbst's figure (*l.c.*) of that sex, is not always present. A most remarkable character of *ulysses*-♀ is the development of a buffish patch behind the cell of the forewings above, composed of long, not very densely set, hairs; this hairy patch is not always very conspicuous, but the hairs are constantly visible under a lens; in the females of the other subspecies, except *orsippus*, this hairy mark is not developed, though in one or the other individual it is indicated by a few hairs.

The anterior part of the cell of the forewing of the ♀ is more or less extended black; the blue area of the hindwings is exteriorly shaded with creamy or buffish scales, which sometimes are almost condensed into discal lunate spots.

Hab. Amboina (3 ♂, 4 ♀); Ceram (1 ♂, 2 ♀); Saparua (2 ♂, 1 ♀).

Not recorded from Buru and Obi.

(b) : *P. ulysses autolyceus* Feld. [♂, ♀].

Papilio ulyssinus, Lucas (*nov* Westwood, 1861), *Bull. Soc. Ent. Fr.* p. 25 (1863) (Aru Is.: *nom. nud.*).

Papilio autolyceus Felder, *Verh. z. b. Ges. Wien* p. 321. n. 428 (1864) (New Guinea; *nom. nud.*); *id.*, *Reise Novara II. Lep.* p. 114. n. 86 (1865) (New Guinea); Oberth., *Et. d'Ent.* IV. p. 42. n. 45 (1879) (New Guinea).

Papilio penelope Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 44. n. 32 (1865) (New Guinea; Waigeu; Aru); Oberth., *Ann. Mus. Civ. Genova* XV. p. 472. n. 9 (1889) (Waigeu).

Papilio telegonus, Kirsch, *Mitth. Mus. Dresden* I. p. 113. n. 9 (1877) (Kordo).

Papilio ulysses var. *autolyceus*, Stauding. & Schatz, *Erat. Schmitt.* I. p. 8 (1884).

Papilio ulysses var. *penelope*, Ribbe, *Iris* I. p. 74. n. 9 (1886) (Aru Is.).

Papilio ulysses, Kirby, *Ann. Mag. N. H.* (6). IV. p. 166. n. 19 (1889) (Louisiane Archipelago); Snellen, *Tijdschr. v. Ent.* XXXII. p. 395 (1889) (Andai; *cc. var.* "—*telegonus* Feld."); Grose Smith, *Nov. Zool.* p. 334. n. 15 (1894).

Smaller than *P. ulysses* L. Forewings below with a whitish spot in the outer half of the cell. Hindwings below with the discal whitish band much reduced; the submarginal spots also smaller, the anterior one sinuate, with the black colour at its outer edge more extended than in *ulysses*.

♂. The cottony stripes, six or seven in number, are on an average narrower than in *ulysses*, but occasionally they are broader than in certain examples of the latter. The blue colour of the hindwings extends often along the subcostal and the upper discoidal nervules, and forms submarginal (adnervular) lines which remind one much of the pattern of the hindwing of *P. ulysses telegonus* Feld.

♀. The cell of the forewings is almost entirely filled up with blue; the hairy discal patch of *P. ulysses* L. is wanting. On the hindwings, the submarginal spots are more irregularly arched, that at the abdominal margin is merged together with the more extended blue area of the wing.

Hab. Dutch and German New Guinea (21 ♂ 5 ♀); Ron Island (1 ♂); Waigeu (4 ♂, 1 ♀); Aru Islands; Fergusson Island (a good series). Not recorded from the Key Islands.

(c): P. ulysses joësa Butl. [σ , ♀ , larva, pupa].

Papilio joësa Butler, *Entom.* IV. p. 318 (1869) (Queensland): id., *Lep. Exot.* I p. 19. t. 8. f. 1. 2 (1870).

Papilio ulysses, Ramsay, *Proc. Linn. Soc. N. S. Wales* p. 12 (1877) (N.E. Austral.); Olliff, *ibid.* p. 395 (1888) (Queensland).

Papilio ulysses var. *joësa*, Sempér, *Journ. Mus. Godeffroy*. Heft 14. p. 43. n. 134 (1878) (Cape York); Standing & Schatz, *Exot. Schmett.* I. p. 8 (1884).

Though *joësa* comes extremely close to *autolyceus*, there are some slight differences between the New Guinean and Queenslandian *ulysses*, at least between the specimens from the northern parts of New Guinea and those from Queensland; from British New Guinea I have only one *female*, which agrees better with *joësa* than with *autolyceus*.

The whitish spot in the cell of the forewings below is larger than in *autolyceus*; the whitish discal band on the underside of the hindwings is also larger. In the *female* the submarginal blue spots of the upperside of the hindwings are liable to obliteration, that between the discoidal nervules is not joined to the blue area of the wing. In the *male* the black spot at the end of the cell of the forewings above is larger than in *autolyceus*.

Hab. Queensland (36 σ , 14 ♀); British New Guinea (1 ♀).

I have some blown larvae and a pupa from Queensland (A. S. Meek *leg.*). The caterpillar resembles in form that of *P. memnon* L. The first thoracic segment bears a small chitinous tubercle at each side dorsally; the last but one abdominal segment is provided with two long denticulated processes. The third segment has a white (natural colour?) transverse dorsal band; the following segments bear two dorsal spots of the same colour except the fourth segment; the spots on the seventh segment are the largest. Between the third and fourth segments there stands a minute black median spot. The pupa agrees fairly well with Horsfield's figure of the pupa of *P. arjuna* Horsf., but is larger, less bent and less constricted.

(d): P. ulysses telemachus Montr. [σ].

Papilio telemachus Montrouzier, *An. Sc. Phys. Nat. Lyon* p. 401 (1856) (Woodlark I.): id., *Essai Faune Woodl.* p. 123 (1857); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 429 (1864); Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 45. n. 34 (1865); Butler, *P. Z. S.* p. 230. n. 96 (1874).

According to the description, this form is smaller than *ulysses*, and the black spot at the end of the cell of the forewings above is wanting.

Hab. Woodlark Island.

(e): P. ulysses ambiguus subsp. nov. [σ , ♀].

Papilio telemachus (?), Godman & Salvin (*see* Montrouzier, 1856), *P. Z. S.* p. 148. n. 37 (1877) (Duke of York I.): *id.*, *loc.* p. 160. n. 43 (1879) (New Ireland).

Papilio montrouzieri, Godman & Salvin (*see* Boisduval, 1859), *Ann. Mag. N. H.* (6). I. p. 101 (1888) (*lapsus typogr.*).

As this geographical form of *ulysses* L. agrees with *telemachus* in the smaller size, and in the black spot at the end of the cell of the forewings being not included in the blue area, Messrs. Godman & Salvin were quite justified in enumerating it as *P. telemachus* (?) Montr. Some of the other Woodlarkian *Papilios*, such as *P. nyamemnon* L., *codrus* Cram., etc., show, however, that the fauna of Woodlark has much closer affinities to that of New Guinea than to that of New Britain, New Ireland, or the Solomon Islands, and render it highly probable that the insects of Woodlark Island, if not specifically or subspecifically distinct, are

the same as those from New Guinea. From Montrouzier's descriptions of the Woodlarkian *Papilio*s and the geographical position of the island I must conclude that most of the Woodlarkian *Papilio*s will have to stand as geographical races under separate names; therefore I think that it is much better to restrict Montrouzier's names to the Woodlark *Papilio*s, which we do not know, than to apply these names with a (?) also to insects which inhabit other localities and which we can examine; and I must satisfy myself by describing the *P. ulysses* from New Britain, etc., under a separate name.

Smaller than both *autolyceus* and *orsippus*, to which it comes nearest; the submarginal spots and the whitish discal bandlike scaling of the underside of the hindwings as in *autolyceus*; the whitish spot in the cell of the forewings below as large as in *joësa*, i.e. larger than in *autolyceus*. The white marginal spots of the forewings are minute, divided by the black endings of the nervules, and sometimes in the male sex almost obliterated.

♂. Forewings above with the woolly stripes as broad as in *ulysses* L.; the blue area is seldom extended to or beyond the apex of the cell; the black spot upon the black discocellular nervule is always joined to the black outer half of the wing. The black marginal region of the hindwings is broader than in *autolyceus*, *joësa*, *ulysses*; at the second discoidal nervule (for example) the blue is extended only two-fifths the way from the cell to the outer margin.

Below, the discal whitish scaling of the hindwings is more reduced than in *autolyceus*.

♀. The blue area of the forewings does not quite reach to the discocellular nervules, and is more or less deeply sinuate within the end of the cell; the blue spot between the lower median nervules has not half the length of the cellule in which it stands, in *joësa* and *autolyceus* it is of about two-thirds the length of that cellule. On the hindwings above the blue submarginal spots are wanting; that before the lower median nervule is sometimes indicated by a few blue scales.

Hab. New Britain (*type*; 8 ♂, 3 ♀); New Ireland (4 ♂, 3 ♀); Duke of York Island.

(*f*): ***P. ulysses orsippus*** Godm. & Salv. [♂, ♀].

Papilio orsippus Godman & Salvin, *Ann. Mag. N. II.* (6). I. p. 101 (1888) (Guadaleanar, Solomon Is.).

Similar to the preceding subspecies.

♂. Blue area of the wings more extended; the spots near the end of the cell of the forewings larger. Below, the wings are darker, especially in the marginal region; the brown basal area of the forewings is more extended, and exteriorly more convex; the submarginal spots of the hindwings, except the last, are almost black; the curved line bordering each spot inside is pronouncedly blue. Marginal white spots of the forewings not divided at the nervules.

In the specimens from Alu, Shortland Islands, the submarginal spots of the hindwings below are not black.

♀. The Guadaleanar *female* has the blue region of the forewings a little less extended along the submedian vein than the preceding race; the blue scales are less closely set, and there is an obvious hairy patch behind the cell; the hindwings have, above, blue submarginal spots; below, the submarginal spots are more yellow than in the *male*.

In the Alu *female* the blue colour is even more reduced than in typical *ulysses*-♀;

a blue patch within the apex of the cell is almost cut off from the blue basal area; the hairy patch is strongly developed; on the hindwings there are, in the antecellular region, only a few blue scales, the blue area being reduced to a triangular patch which extends on the disc only a little beyond the apex of the cell.

Hab. Solomon Islands: Guadalcanar (2 ♂); Alu (1 ♂, 2 ♀).

The specimens from the Northern and Southern Solomon Islands may turn out to belong to two races.

(*g*): ***P. ulysses telegonus*** Feld. [♂, ♀].

Papilio telegonus Felder, *Wien. Ent. Mon.* IV. p. 226. n. 73 (1860) (Batjan): id., *Verh. z. b. Ges. Wien* p. 322. n. 430. & p. 370. n. 257 (1864) (Batjan: Gilolo): id., *Reise Novara II. Lep.* p. 116. n. 87. t. 19. f. a. b. c (1865); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 44. n. 33 (1865) (Batjan: Gilolo); Oberth., *Et. d'Ent.* IV. p. 42. n. 44 (1879) (Ternate; Halmahera); id., *Ann. Mus. Civ. Genova* XV. p. 471. n. 8 (1880) (Ternate; "Andai" *loc. err.*).

Papilio ulyssodes Westwood, *Proc. Ent. Soc. Lond.* V. p. 73 (1861) (Batjan: *nou. aud.*).

Papilio ulysses var. *telegonus*, Stauding. & Schatz, *Exot. Schmett.* I. p. 7. t. 4 (♂) (1884).

The cottony stripes of the *male* are very broad; the posterior ones are merged together for almost their whole length. The submarginal blue lines of the hindwings, situated along the nervules, vary in number; the anterior one is sometimes joined to the blue area of the wing. The submarginal spots of the hindwings beneath are sometimes all ochraceous; the middle ones are often divided into two spots each by a black line; seldom one or other of the spots is as black as in *P. ulysses orsippus* Godm. & Salv.

In the *female* the blue area of the forewings is of about the size of that of *P. ulysses*-♀; the discal black patch within the blue area and the hairy mark are wanting. The subdiscal blue lunules of *ulysses* have here developed into more or less quadrangular spots, of which the second and third are joined to a submarginal, adnervular blue line.

Hab. Batjan (11 ♂, 4 ♀); Ternate; Halmahera (8 ♂, 3 ♀).

This is certainly the most conspicuous form of *P. ulysses*, and its distinguishing characters are more pronounced and constant than in any other subspecies of *ulysses*. The blue longitudinal lines in the black marginal region of the hindwings appear only in this subspecies, but are indicated in *autolyceus* Feld. and *joësa* Butl. by the blue area extending streaklike along the nervules.

159. ***Papilio montrouzieri*** Boisd. [♂, ♀]

Papilio montrouzieri Boisduval, *Bull. Soc. Ent. Fr.* p. 155 (1859) (New Caledonia): Lucas, *Bull. Soc. Ent. Fr.* p. 25 (1863) (New Caledonia); Feld., *Verh. z. b. Ges. Wien* p. 322. n. 431 (1864); id., *Reise Novara II. Lep.* p. 118. n. 88 (1865); Butl., *P. Z. S.* p. 290. n. 97 (1874); id., *Ann. Mag. N. H.* (4). XX. p. 357. n. 30 (1877) (Lifu I.); Oberth., *Et. d'Ent.* IV. p. 41. n. 42 (1879) (New Caledonia; "spec. typ.").

Papilio chandoiri Felder, *Wien. Ent. Mon.* IV. p. 99. t. 2. f. 1 (1860) ("Moluccas" *loc. err.*); id., *Verh. z. b. Ges. Wien* p. 322. n. 432 (1864) ("Aru?" "Moluccas?" *loc. err.*); id., *Reise Novara II. Lep.* p. 118. sub n. 88 (1865); Butl., *P. Z. S.* p. 290. n. 95 (1874).

Papilio (ulysses var.) *ulyssinus* Westwood, *Proc. Ent. Soc. Lond.* V. p. 73 (1861) (New Caledonia).

The twenty-seven specimens of this insect in my collection from the island of Lifu exhibit such a variation in the number and size of the cottony stripes in the *male*, and in the extent of the blue colour on the wings in either sex, that I cannot specifically distinguish the *Papilios* described under the names of *montrouzieri* Boisd., *ulyssinus* Westw., *ulyssellus* Westw., *chandoiri* Feld., and *westwoodi* Oberth.; this latter excepted, the "species" were almost contemporarily described;

montrouzieri has the priority of date. *P. alyssinus* Westw. is exactly identical with *P. montrouzieri* Boisd. *P. chandoiri*, to which Felder gave the erroneous locality "Moluccas," and which, according to the type-specimen in my collection, came certainly from New Caledonia, differs from typical *montrouzieri* in having four cottony stripes on the forewings and in having the blue colour more reduced; the other characters by which Felder (*Reise Novara, l.c.*) distinguishes *chandoiri* from *montrouzieri* are individual and partly imaginary. In *P. westwoodi* Oberth. the blue area of the wings is still more reduced than in *chandoiri*, and the males have four or five cottony stripes; on the other hand, the blue colour is much more extended and the cottony stripes have almost or entirely disappeared in Westwood's ab. *alyssellus*. Between the two extreme forms, *westwoodi* and *alyssellus*, there exist every intergradation, so that there is no doubt that all these forms belong to one species. As I have not received *westwoodi* from the island of Lifu, where *chandoiri* and *alyssellus* fly together with typical *montrouzieri*, it seems to me not improbable that *westwoodi* inhabits the main island of New Caledonia, and may turn out to be a local form; from this reason, and because *chandoiri* stands intermediate between *montrouzieri* and *westwoodi*, I keep *westwoodi* Oberth. separate under a varietal name, and treat *chandoiri* as a synonym of *montrouzieri*.

(a²): ♂-ab. *alyssellus* Westw.

Papilio (*alyssus* var.) *alyssinus* ab. *alyssellus* Westwood, *Proc. Ent. Soc. Lond.* V. p. 93 (1860) New Caledonia).

Cottony stripes almost or entirely absent.

In a specimen in my collection there is no trace of the cottony stripes visible even under a lens; in the type of *alyssellus* in the British Museum the stripes are not entirely obliterated. The blue region of the wings is in my specimen much enlarged, the black border of the forewings being of a breadth of 5 mm. at the lower median nervule, and extending a good way (4 mm.) beyond the end of the cell.

(b²): ab. *westwoodi* Oberth.

Papilio westwoodi Oberthür, *Et. d'Ent.* IV. p. 41. n. 43. t. 3. f. 2 (1879) (New Caledonia).

With four or five cottony stripes in the ♂; the blue colour of the wings much restricted in both sexes.

Hab. New Caledonia, without precise locality (5 ♂, 4 ♀); Lifu (25 ♂, 2 ♀).

XXVIII. PAYENI-GROUP.

First subcostal nervule of the forewings not joining the costal vein; second discocellular veinlet to the forewings concave, twice as long as the first discocellular nervule. Three aberrant species.

160. *Papilio payeni* Boisd. [♂, ♀].

Papilio payeni Boisduval, *Spec. Gén. Léop.* I. p. 235. n. 58 (♂) (1836) (Java); Hœv., *Tijdsch. Nat. Gesch.* V. p. 340. t. 8. f. 2. A. F. (1838); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 34 (1840); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 103 (1846) (Java); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 125 (1852) (Java); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 243 (1861) (Java); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 109 (1865) (*μ.μ.*); Standing. & Schatz, *Ernt. Schmelt.* I. p. 10 (1881); Haase, *Unters. üb. Mim.* p. 35 (1893); Fruhst., *Ent. Nachr.* p. 301 (♂, ♀) (1894) (Mount Gede, 5000 feet, Java, 1 ♂).

Three subspecies belong to this *Papilio* :—

(a): **P. payeni** Boisd., forma typ. [♂, ♀].

A very rare species. The Sumatran examples belong to the following race.

Hab. Java (1 ♂).

(b): **P. payeni brunei** Fruhst. [♂].

Papilio payeni, Wallace (*unc* Boisduval, 1836), *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 109 (1865) (*p.p.*): Heylarts, *Tijdschr. v. Ent., Verst.* p. 29 (1891) (Sumatra); Hagen, *Iris* VII. p. 29. n. 49 (1894) (Sumatra).

Papilio brunei Fruhstorfer, *Ent. Nachr.* p. 300 (♂) (1894) (Brunei, N. Borneo).

Stands in some characters intermediate between *P. payeni* and the Indian *P. payeni evan* Doubl.

My Bornean *male* does not quite agree with Mr. Fruhstorfer's description, as it has on the underside of the hindwings, besides the submarginal line, only one continuous line midway between outer margin and cell. There is a series of six silvery spots on the disc of the hindwings below; the anterior and the two posterior spots are the largest; my specimen of *P. payeni* Boisd. has only the two posterior silvery spots, while in *P. payeni evan* Doubl. all six spots are marked by a few silvery scales, the two posterior being more obvious.

Hab. Borneo (1 ♂); Sumatra (1 ♂).

(c): **P. payeni evan** Doubl. [♂, ♀].

Papilio evan Doubleday, *Ann. N. H.* XVI. p. 235. & p. 304 (1845) (Sylhet); id. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 104. t. 2. f. 2 (♀) (1846) (N. India); Westw., *Cub. Oc. Ent.* p. 63. t. 31. f. 1. 1* (♂) (1848) (Sylhet); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 244 (1864) ("Darjeeling" *loc. err.*; Sylhet); Oberth., *Et. d'Ent.* IV. p. 60. n. 159 (1879) (Sylhet); Heylarts, *Tijdschr. v. Ent., Verst.* p. 29 (1891); Haase, *Untersuch. üb. Mim.* p. 35. f. 5 (1893).

Papilio payeni var. *evan*, Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 125 (1852) (Sylhet).

Papilio payeni, Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 110. n. 222 (1857) ("Darjeeling" *loc. err.*).

Meandrusa evan, Moore, *New Ind. Lep. Ins.* p. 284 (1888); Swinh., *Tr. Ent. Soc. Lond.* p. 313. n. 388 (1893) (Khasia Hills).

Papilio (Meandrusa) evan, Nicéville, *Gazetteer of Sikkim* p. 175. n. 503 (1894) (Sivoke, 1 ♂; in Bhutan and the Khasia Hills somewhat common in July and August).

A specimen in my collection labelled "*P. evan* ♂. Assam" is of the size of *P. payeni*; above it agrees best with *evan*, below with *payeni*. The locality "Assam" may be erroneous; I got the specimen from a French dealer. A second Khasia Hills specimen, obtained from Rev. Hamilton, is also not larger than *P. payeni* Boisd. The wings of the *female* are much less falcate than those of the *male*, and much paler.

Hab. Assam (12 ♂, 4 ♀).

161. **Papilio gyas** Westw. [♂, ♀].

Papilio gyas Westwood, *Arc. Ent.* p. 41. t. 11. f. 1 (♂) (1841) (Assam); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 10. n. 43 (1846) (N. India: Assam); Gray, *Cat. Lep. Ins. B. M.* I. p. 16. n. 62 (1852) (N. India); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 110. n. 221 (1857) (Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 242. & p. 352. n. 138 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 65. sub n. 100 (1865); Moore, *P. Z. S.* p. 672 (1867); Oberth., *Et. d'Ent.* IV. p. 60. n. 149 (1879) ("Inde"); Stauding & Schatz, *Exot. Schmett.* I. p. 10 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 437. n. 434 (1888) (Sikkim: very rare: ♀ noticed); Haase, *Untersuch. üb. Mim.* p. 35 (1893).

Dabusa gyas, Moore, *New Ind. Lep. Ins.* p. 283 (1888); Swinh., *Tr. Ent. Soc. Lond.* p. 313. n. 388 (1893) (Khasia Hills).

Papilio (Dabusa) gyas, Nicéville, *Gazetteer of Sikkim* p. 175. n. 502 (1894) (Sikkim: very rare: 6000 to 7000 feet).

Forewings somewhat variable in length. Sexes different, the *male* being above almost of a uniform dull brown colour, with a series of submarginal and, on the forewings anteriorly, some subdiscal lighter spots, while the *female* has, besides the spots, a broad white median band which is anteriorly abbreviated.

Hab. Assam (Khasia Hills; 20 ♂, 5 ♀); Sikkim (1 ♂, 4 ♀); Bhutan (O. Möller, July to September; 5 ♂).

162. *Papilio hercules* Blanch. [♂, ♀].

Papilio hercules Blanchard, *Compt. Rend.* p. 809 (note) (1871).

♂ ♀. *Papilio swiron* Leech, *Entomol.* XXIII. p. 192 (1890) (W. China).

♂ ♀. *Papilio gyas* var. *hercules*, Leech, *Bull. from China* p. 535. t. 32. f. 1 (♂) (1893) (W. China).

Both sexes similar, having a fulvous median band to the wings which corresponds with the white band in the *female* sex of *P. gyas*, but is narrower, less so in the *female* than in the *male*.

Hab. Western China (6 ♂, 1 ♀).

I cannot understand why Mr. J. H. Leech, in his great work on the *Butterflies from China and Japan*, treats this very distinct species as a local variety of *P. gyas* Westw.

XXIX. PODALIRIUS-GROUP.

This group has only two species in the regions dealt with in this paper; all the other species are American.

First subcostal branch of the forewings free, as in the preceding group; second discocellular veinlet straight and not longer than the first (*P. leosthenes* Doubl.), or feebly bent and half as long again as the first (*P. podalirius* L.).

Note.—The larva and pupa of this group agree with those of the following groups. The imago has blue metallic scales on the hindwings, which are met with in all the species of the preceding groups, exclusive of Groups I. to III., and which are absent from all the species of the following groups.—K. J.

163. *Papilio podalirius* L. [♂, ♀, metam.]*

Hoeftnagel, *Archetypus Stud.* III. t. 12 (1592); Aldrovandus, *De Anim. Ins.* p. 239. t. 2. f. 3 (1602); Hoeftnagel, *Ins.* Vol. I. t. 8 (1630); Moufet, *Ins. Theatr.* p. 99. n. 3 (1634); Hollar, *Dir. Ins.* t. 7. f. 1 (1646); Jonston, *Hist. Nat. Ins.* p. 31. t. 1. 2. f. 3 (1657); Petiver, *Mus.* p. 68. n. 724 (1700); id., *Gazophyl.* t. 133. f. 2 (1702); Rajus, *Hist. Nat. Ins.* p. 111. n. 3 (1710); Merian, *Eruc. Oct.* II. p. 43. t. 44 (1717); cad., *Eur. Ins.* p. 48. t. 94. & p. 80. t. 163 (1730); Réaumur, *Mém.* I. p. 345. t. 11. f. 3-5 (1734); Roesel, *Ins. Belust.* I. 2. p. 9. t. 2 (1746); Geoffroy, *Mém. Ins. Paris* II. p. 56. n. 24 (1762); Gronov., *Zoophyl.* p. 189. n. 732 (1761); Sela, *Thes.* IV. t. 32. f. 11. 12. & t. 40. f. 13 (1765); Schaeffer, *Icon. Ins. Ratish.* I. t. 45. f. 3. 4 (1766).
Papilio Eques Arctivus podalirius Linné, *Syst. Nat.* ed. x. p. 463 (nota) (1758); Scopoli, *Ent. Carn.* p. 167. n. 445 (1763); Linné, *Mus. Lud. Utr.* p. 208. n. 27 (1764); Hoeftnagel, *Berl. Magaz.* II. p. 58. n. 2 (1766); Houtt., *Naturl. Hist.* I. II. p. 211. sub n. 29 (1767); Linné, *Syst. Nat.* ed. xii. p. 751. n. 36 (1767); Pallas, *Reisen versch. Proor. Russ. Reich.* I. p. 183 (1771); Lepechin, *Tagebuch* p. 189 (1771); Müller, *Naturs.* V. 1. p. 577. n. 36 (1774); Fabr., *Syst. Ent.* p. 451. n. 38 (1775); Esper, *Eur. Schm.* I. p. 36. t. 1. f. 2. & p. 386. t. 50. Suppl. t. 26. f. 1 (1777-80); Goeze, *Ent. Beytr.* III. 1. p. 61. n. 36 (1779); Bergstrasser, *Nomencl.* II. p. 17. t. 18. f. 1-4 (1779); Fabr., *Spec. Ins.* II. p. 15. n. 58 (1781); Blumenbach, *Handb.* ed. ii. p. 356. n. 4 (1782); Gescnius, *Handb. f. Schmetz.* p. 51. n. 2 (1786); Fabr., *Mant. Ins.* II. p. 8. n. 64 (1787); Schneider, *Eur. Schmetz.* p. 55. n. 4 (1787); Jablonsky & Herbst, *Naturs. Schmetz.* III. p. 170. n. 103. t. 45. f. 3. 4 (1788); Villers, *Carol. Linn. Entom.* II. p. 4. n. 3

* As in the case of *P. machaon* L., the bibliography of this species is quite incomplete.

- (1789); Fabr., *Ent. Syst.* III. 1. p. 24. n. 71 (1793); Lewin, *Ins. Gr. Bot.* p. 74. t. 35 (1795); Donovan, *Brit. Ins.* IV. p. 3. t. 109 (1795); Panzer, *Fauna Ins. Germ.* Hft. 30. t. 24 (1796); Prunner, *Lep. Pedem.* p. 3. n. 4 (1798); Hübner, *Eur. Schmett.* I. t. 77. f. 388, 389 (1798-1803); Turton, *Syst. Nat.* III. 2. p. 16 (1806); Ochsenheimer, *Schmett. Eur.* I. 2. p. 118. n. 2 (1808).
- Papilio podalirius* Fuesslin (Fuessly), *Verz. Schweiz. Ins.* p. 28. n. 544 (1775); Walkenaer, *Faune Paris.* II. p. 261. n. 1 (1802); Latreille, *Hist. Nat. Crust. Ins.* XIV. p. 109. n. 2 (1805); Godart, *Enc. Méth.* IX. p. 50. n. 74. t. 9. f. 5 (1819); id., *Hist. Nat. Lép. France* p. 36. t. 1. f. 1 (1821); Duponchel, *Icon. Chen. France* p. 40. t. 1. f. 1 (1832-36); Curtis, *Brit. Ent.* XIII. t. 578 (1836); Boisduval, *Spec. Gén. Lép.* I. p. 245. n. 70 (1836); Selys-Longchamps, *Cat. Lép. Belg.* p. 14. n. 1 (1837); Blanchard, *Hist. Nat. Ins.* III. p. 421. n. 5 (1841); Duponchel, *Cat. Méth. Lép. d'Eur.* p. 21 (1844); Lucas, *Lép. d'Eur.* p. 22. t. 14. f. 1 (1845); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 15. n. 124 (1846); Hutton, *Fr. E. Soc. Lond.* V. p. 47. n. 2 (1847); Gray, *Cat. Lep. Ins. Brit. Mus.* I. p. 31. n. 146 (1852); Lucas, Chenu's *Enc. d'Hist. Nat., Pap.* p. 37 (1853) (*p.p.*); Speyer, *Geogr. Verbr. Schmett.* p. 277. n. 1 (1858); Trimoulet, *Cat. Lép. Gironde* p. 10. n. 1 (1859); Praun, *Eur. Tagf. Pap.* IX. *Papil.* t. 1. f. 3. 4 (1859); Fritsch, *Verh. z. b. Ges. Wien* pp. 238, 240, 642, 862, 864 (1862); Felder, *ibid.* p. 304. n. 209. & p. 348. n. 14 (1864); Lederer, *Ann. Soc. Ann. Belg.* p. 53 (1865) (Anatolia); Mann, *Verh. z. b. Ges. Wien* p. 325 (1866) (Dobruzscha); id., *l.c.* p. 66 (1867) (Militär Grenze); id., *l.c.* p. 832 (1867) (Bozen); Trient; White, *Entomol.* p. 57 (1867) (Como); Snellen, *Vind. Ned.* p. 69. note (1867); Mann, *l.c.* p. 373 (1869) (Dalmatia); Lederer, *Ann. Soc. Ent. Belg.* p. 18 (1870) (Transcaucasia); Fondu, *C. R. Soc. Ent. Belg.* p. 84 (1875) (Belgium); Walker, *Ent. Mo. Mag.* XV. p. 194 (1879) (Baklar, Turkey); gen. I., April; gen. II., June 27th); Oberthur, *Et. d'Ent.* IV. p. 64. n. 163 (1879); Swinton, *Ent. Mo. Mag.* XVI. p. 40 (1879) (Trin, July to August); Jordan, *ibid.* p. 87 (1879) (Stalden, June to July); Forbes, *ibid.* p. 257 (1879) (W. Alp., June to July); Jordan, *ibid.* p. 267 (1880) (Wallis, June); Mathew, *ibid.* XVIII. p. 29 (1881) (Turkey); Romanoff, *Russ. Mém. Lep.* I. p. 41 (1884) (Transcaucasia); Jones, *Ent. Mo. Mag.* p. 151 (1887) (Lugano); Calberla, *Iris* p. 121 (1887) (Mittel Italien); Jones, *l.c.* p. 209 (1888) (France m. r.); Standfuss, *Berl. E. Zeit.* p. 233 (1888); Mimà-Palumbo e Failla-Tedaldi, *Natur. Sicil.* p. 19 (1889) (Sicilia); Bramson, *Tagfalter* p. 13 (1890); Hofmann, *Reup. Schm. Eur.* p. 1. t. 1. f. 1 (1890); Steinert, *Iris* IV. p. 174 (1891) (Dresden); Staudinger, *Iris* V. p. 304 (1892) (Kentei-Geb., östl. v. Kiachta); Standen, *Entomol.* p. 261 (1893) (Corsica); Nicholson, *ibid.* p. 210 (1893) (Budapest); Colebey, *ibid.* p. 299 (1893) (Corsica); Bromilow, *ibid.* p. 347 (1893) (Alp. mar.); Caradja, *Iris* VI. p. 169 (1894) (Haute Garonne); Rühl & Heyne, *Grossschmett.* p. 81. 692 (1892-95).
- Papilio Eques Achivus sinon* Poda, *Mus. Graec.* p. 62. n. 2. t. 2. f. 1 (1761).
- Papilio Eques Achivus flammeus* Fourcroy, *Ent. Paris.* II. p. 242. n. 24 (1785).
- Pieris podalirius*, Schrank, *Fauna boica* II. 1. p. 163. n. 1286 (1801).
- Iphiclides podalirius*, Hübner, *Verz. bek. Schmett.* p. 82. n. 835 (1816).
- Podalirius europaeus* Swainson, *Zool. Illustr.* (2). II. p. 105 (1831-33).
- Papilio podalirius* var. *dilatata* Selys, *Ann. Soc. Ent. Belg.* p. 4 (1831) (à dessin faiblement ébouché, à queue contournée, obtenue d'éclosion par M. Donckier: *monstr.*).
- Papilio sinon*, Staudinger, *Cat. Lep. Eur.* p. 1 (1871).
- Papilio podalirius nigrescens* Eimer, *Artbild. Schmett.* p. 81. 82. f. E (1889) (*bred specimen with the black colour of the wings much expanded*).

Papilio podalirius L. has four local races:—

- (a): *P. podalirius* L. from Central Europe;
- (b): *P. podalirius feisthameli* Dup. from South-East Europe and North Africa;
- (c): *P. podalirius virgatus* Butl. from Asia Minor;
- (d): *P. podalirius podalirinus* Oberth. from Western China.

The spring brood generally differs from the summer brood (or broods) in having the hairs of the front of the head longer, the black bands on the wings broader, and the abdomen blacker on the upperside.

(a): **P. podalirius** L., forma typ. [♂, ♀, metam.].

One brood in the northern parts of its range. The black bands of the forewings are often divided longitudinally.

(a'): ab. *undecimlineatus* Eimer.

Papilio podalirius undecimlineatus Eimer, *Arthbild. Schmett.* p. 11. t. 1. f. 3 (1889). Rühl, *Grossschmetterl.* p. 80. 693 (1892-95).

Forewing with eleven black bands.

(b²): ab. *miegi* Mieg.

Papilio podalirius ab. *miegi* Mieg, *Le Naturalist* (2). XI. p. 71 (1889) (Pyr. or.); Rühl, *Grossschmett.* p. 81 (1892); Caradja, *Iris* VI. p. 169 (1894) (Haute Garonne).

Intermediate between *P. podalirius* L. and *P. podalirius feisthameli* Dup.
Chiefly in South France.

Besides these two aberrations there occur numerous other varieties of our *Papilio*, especially as regards the number, length, and breadth of the black bands on the wings; the discal orange band on the underside of the hindwings is sometimes also well marked on the upperside; the orange spot before the anal ocellus varies in shape.

The summer brood, which is not always different from the spring brood, has to stand as—

(c²): ab. gen. aest. *zanclus* Zeller.

Papilio podalirius var. *zanclus* Zeller, *Isis* p. 213 (1847); Calberla, *Iris* p. 121 (1884) (Mittel Italien); Minà-Palumbo e Failla-Tedaldi, *Natur. Sicil.* p. 20 (1889) (Sicilia, gen. II.); Eimer, *l.c.* p. 72 (1889); Rühl, *Grossschmett.* p. 80 (1892); Bromilow, *Entomolog.* p. 347 (1893) (Alp. mar.); Caradja, *Iris* VI. p. 169 (1894) (Haute Garonne).

Abdomen seldom entirely white; hairs of the front of the head short.
Especially in South Europe.

Hab. Central and South-East Europe (not in England, Holland, Denmark, Sweden; very rare in North-West Germany) (18 ♂, 20 ♀).

Lewin (*l.c.*) records this species erroneously as British.

(b): ***P. podalirius feisthameli*** Dup. [♂, ♀].

Papilio feisthameli Duponchel, Godart's *Lép. de France*, Suppl. I. p. 7. t. 1. f. 1 (1832); Pierret, *Bull. Soc. Ent. Fr.* p. 59 (1836) (Perpignan: aut *P. podal.* ab. *miegi*?). Hierich-Schäffer, *Schmett. Eur.* I. f. 414-416 (1848); Levaillant, *Ann. Soc. Ent. Fr.* p. 407 (1848) (Algérie); Fonscolombe, *ibid.* Bull. p. 48 (1849); Lucas, *ibid.* Bull. p. 83 (1850); Lederer, *Verh. z. b. Ges. Wien* p. 27 (1852); Felder, *Verh. z. b. Ges. Wien* p. 303. n. 208. & p. 348. n. 113 (1864); Seriziat, *Col. Lép. Collo.* p. 2. n. 1 (1887) (Collo, April and July).

Papilio podalirius et var. *feisthameli*, Rambur, *Lép. de l'Andalousie* p. 59. n. 1 (1858).

Papilio podalirius var. *feisthameli*, Graslín, *Ann. Soc. Ent. Fr.* p. 331 (1863) (Pyr. or.); Allard, *ibid.* p. 312 (1867) (Algérie); Staudinger, *Ent. Mo. Mag.* p. 181 (1880) (Portugal, April); Oberthur, *Ann. Soc. Ent. Fr.* p. 165 (1886); Elwes, *Tr. Ent. Soc. Lond.* p. 389 (1887) (Pyr. or., up to 5000 feet); Staudinger, *Iris* V. p. 277 (1892) (Tunis); Rühl, *Grossschmett.* p. 80. 693 (1892-95); Caradja, *Iris* VI. p. 169 (1894) (not found in the departm. of Haute Garonne).

Papilio podalirius, Lucas, in Chenu's *Ent. d'Hist. Nat., Pap.* p. 5. f. 15. & p. 30. f. 106 (1851-53); Voigt, *Stett. Ent. Zeit.* p. 22 (1890) (Granada).

Chiefly distinguished from *P. podalirius* by the heavier black bands on the wings, and by the reddish-orange anal mark to the hindwings being almost of uniform breadth.

In Algiers the summer brood is remarkable for the much less dense scaling in the costal region of the forewings:—

(d²): ab. gen. aest. *latteri* Aust.

Papilio ab. latteri Austant, *Petit. Nouv. Ent.* II. p. 293 (1879).

Papilio podalirius var. *latteri*, Oberthür, *Et. d'Ent.* IV. p. 64. sub n. 163 (1879). Rühl, *Grossschm.* p. 80. 693 (1892-95).

Papilio feisthameli var. *latteri*, Baker, *Ent. Mo. Mag.* XXII. p. 250 (1886).

Papilio feisthameli latteri, Eimer, *l.c.* p. 72. t. 1. f. 4 (1889).

Front of the head with short hairs; abdomen white for the most part, dorsal black line narrow. Not always larger than the spring brood of *feisthameli*.

Hab. Pyrenees, Spain, Portugal, North Africa [7 ♂, 7 ♀].

(c): ***P. podalirius virgatus*** Butl. [♂, ♀].

Papilio virgatus Butler, *P. Z. S.* p. 430. t. 25. f. 1 (1865) (Damascus).

Papilio podalirius virgatus, Eimer, *l.c.* p. 74 (1889).

Papilio podalirius var. *virgatus*, Rühl, *Grossschmett.* p. 80 (1892).

Differs from *P. podalirius feisthameli*, to which it comes nearest, chiefly in the narrower hindwings, the smaller orange mark in front of the anal ocellus, and in the thin and abbreviated black bands on the upperside of the hindwings.

As the abdomen is black on the upperside, I treat *virgatus* as belonging to a spring brood, though I have no evidence that the few specimens I have seen were taken in the spring.

The summer brood is larger, and corresponds in characters with the second brood of *feisthameli*:—

(v²): ab. gen. aest. *smyrnensis* Eimer.

Papilio podalirius smyrnensis Eimer, *l.c.* p. 94. f. M (1889) (Smyrna).

Hairs of the front of the head short. Black band on the upperside of the forewings, situated at the end of the cell, not reaching the submedian vein. Abdomen more extended white, with the dorsal black line abbreviated.

From ab. *latteri* Aust. it can be distinguished by the narrowness of the three black bands on the upperside of the hindwings; of these bands the two discal ones are obsolete posteriorly, and that along abdominal margin is almost hairlike.

Hab. Asia Minor.

(d): ***P. podalirius podalirinus*** Oberth. [♂].

Papilio podalirinus Oberthür, *Et. d'Ent.* XIII. p. 37. t. 9. f. 99 (1890) (Tse-ku).

Papilio podalirinus, Leech, *Bull. from China*, etc. p. 519 (1893) (Ta-t sien-lu).

"Differs from the type in having all the transverse black streaks or bands on primaries wider and more continuous, and the central area of these wings suffused with dusky; on the secondaries there is a bright reddish band between the central black streaks, and the lunule above the anal spot is of the same colour" (Leech, *l.c.*).

Hab. Western China; very rare; probably more abundant in Thibet proper.

Note.—*Papilio ajax* L. and *P. marcellus* Bois. (= *P. ajar* Esp.) are erroneously recorded by several authors as inhabiting Europe: cf. Esper, *Eur. Schm.* I. *Cont.* p. 1 t. 51. cont. 1 (1780); Lucas, *L'ap. d'Eur.* p. 23. t. 14. f. 2. (1845); Dutreux, *Stett. E. Zeit.* p. 142 (1854).

164. *Papilio leosthenes* Doubl. [♂, ♀].

Papilio leosthenes Doubleday, *Ann. Mag. N. H.* XVIII. p. 372 (1846); Gray, *Cat. Lep. Ins. Brit. Mus.* I. p. 30. t. 3. f. 1 (1852); Felder, *Verh. z. b. Ges. Wien* p. 303. n. 207. & p. 348. n. 111 (1864); Oberthür, *Et. d'Ent.* IV. p. 64. n. 162 (1879); Eimer, *Artb. b. Schmett.* p. 160. t. 3. f. 1 (1889).

Forewings semitransparent, chiefly owing to the scales being partly hairlike. Besides the four bands crossing the cell of the forewings, there is in many specimens a small black mark between the two upper of these bands, indicating an additional band which corresponds to the fourth band of the species of the *aristeus*-group.

Hab. Northern Australia (14 ♂, 5 ♀).

Note.—In the groups IV. to XXVIII. the scaling of the wings is as a rule dense; in groups I. to III. and in *Troides* we have already seen that the scales of the upper layer of the forewings, seldom those on the hindwings, have a tendency to become narrow and to assume a hairlike character. In the present and the following groups this tendency is very obvious. In *aristeus* and its allies the difference between the upper and under scales is very feeble; in the species allied to *antiphates* Cram. the upper scales of some of the light, not of the dark, portions of the forewings above become hairlike; in other groups (*eurypylyus* L.) the under scales disappear and the membrane bears, on the light parts of the upperside of both wings, only the hairlike upper scales; a further step is shown by *P. agamemnon* L., *codrus* Cram., and allies, in which also the light parts of the underside of the forewings, and partly those on the underside of the hindwings, lose the scaling. In all cases where the scaling becomes thin, the membrane assumes a green or blue colour. This colour can already be noticed in *P. leosthenes* Doubl.—K. J.

XXX. GLYCERION-GROUP.

First subcostal branch of the forewings confluent with the costa. Upper discocellular veinlet to the forewings much longer than the second. Light bands of the forewings with hairlike scales in the anterior region. Abdominal fold of the hindwings of the *male* feebly developed; no cottony scent-organ. This group is confined to Northern India, Thibet, and China. The five species, with two subspecies, are of three different types:—

(1) The North Indian *glycerion* Gray, with a local form *caschmirensis* m., is represented in China by *eurous* Leech.

(2) The Chinese *mandarinus* Oberth. is represented in Northern India by a local form (*paphus* Nicév.).

(3) The Eastern Chinese *alebion* Gray has in Western China and Thibet as representative species *P. tamerlanus* Oberth.

These species can be distinguished as follows:—

1. *a.* Hindwings, upperside, without median black line; underside with two median black lines, including between themselves three yellow spots; cell long, its apical half very narrow.

P. glycerion and *caschmirensis* from Northern India.

b. The Chinese representative of *glycerion* has a discal black line on the upperside of the hindwings. *P. eurous* from China.

2. *c.* Hindwings, upperside, with one black median line; underside, anteriorly in the middle with an elongate marking resembling the number 8.

P. mandarinus from China and *paphus* from Northern India.

3. *d.* Hindwings, both sides, with one black straight median line; underside, with a yellow spot outside this line. Anal yellow mark not divided into two separate spots.

P. alabion from Eastern and Central China.

- e.* As before, underside less yellowish; anal yellow mark smaller, divided into two spots.

P. tamerlanus from Western China.

165. *Papilio glycerion* Gray [♂].

- Papilio glycerion* Gray, *Zool. Misc.* p. 32 (1831) (Nepaul); Boisdu, *Spec. Gén. Léop.* I. p. 247. n. 71 (1836); Westw., *Arc. Ent.* II. p. 24. t. 55. f. 3 (1843); Gray, *Lep. Ins. Nep.* p. 6. t. 3. f. 2 (1846); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 15. n. 122 (1846) (Nepaul; Assam); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 116. n. 234 (1857) (Darjeeling); Felder, *Verh. z. b. Ges. Wien* p. 301. n. 182. & p. 346. n. 91 (1864); Moore, *P. Z. S.* p. 758 (1865) (Bengal; high hills); Oberth., *Et. d'Ent.* IV. p. 64. n. 165 (1879) (*p.p.*); Standiog. & Schatz, *Exot. Schm. I.* p. 9 (1884); Elwes, *Tr. Ent. Soc. Lond.* p. 432. n. 424 (1888) (Sikkim; May to June, 2000 to 4000 feet); Eimer, *Artbild. Schm. I.* p. 66. t. 1. f. 2 (1889) (Sikkim); Haase, *Unters. üb. Mim.* p. 31 (1893).
- Pazala glycerion*, Moore, *New Ind. Lep. Ins.* p. 283 (1888); Swinh., *Tr. Ent. Soc. Lond.* p. 313. n. 390 (1893) (Shillong).
- Papilio (Pazala) glycerion*, Nicéville, *Gazetteer of Sikkim* p. 174. n. 491 (1894) (Sikkim; at low elevations, in May and June).

(*a*): ***P. glycerion*** Gray, forma typ. [♂].

The discoidal cell to the hindwings is longer and narrower in this and the next *Papilio* than in any of the other species of this group.

Hab. Nepaul; Sikkim (16 ♂); Assam (1 ♂).

The specimens from Sikkim and those from Cashmere exhibit considerable differences, which appear to be constant; the examples from Nepaul stand between these two extreme forms, and unfortunately it was a Nepaul specimen which served Gray for the description of his species. As the differences between the Nepaul and Sikkim forms on the one side, as well as between the Nepaul and Cashmere races on the other side, are not important enough and not at all constant, it will be best to distinguish only two Indian local races of *glycerion*, and to apply the name of *glycerion* Gray to the Sikkim specimens and part of the specimens from Nepaul, while the Cashmere race and the specimens from Nepaul which come nearest to it must receive a new name :—

(*b*): ***P. glycerion caschmirensis*** subsp. nov. [♂].

The bands on the wings are less black and thinner than in typical *glycerion* Gray; the anal angle of the forewings has more white; the anal yellow spot on the hindwings is of a much paler colour; the discal series of yellowish markings on the underside of the hindwings is also much paler; the two discal black lines bordering these markings are less close together; the exterior line is much farther bent towards the outer margin of the wing between the subcostal and upper discocellular veins. While in *P. glycerion* Gray the light parts of the costal and apical region of the forewings are perfectly transparent, owing to the absence of white scales, these parts are only partly transparent in *P. glycerion caschmirensis*, since the discoidal cell is for the most part overpowered, on the upperside of the forewing, with white

scales. The scales of the black bands are much broader in the costal region of the forewings in *cuschnirensis* than in *glycerion*. The difference in the extent of the white scaling can easily be seen without a lens when one puts a piece of black paper underneath the wings. The forewings of *glycerion* are also much more glossy than those of *cuschnirensis*.

Hab. Cashmere and North-West India (type from North Cashmere) (7 ♂).

166. *Papilio eurous* Leech [♂].

Papilio eurous Leech, *Batt. from China*, etc. p. 521. t. 32. f. 3 (♂) (1893) (Chang Yang, Central China).

Differs from the preceding species in the more pointed apical angle of the forewings, the more triangular hindwings, the broad black bands, the presence of a median black line on the upperside of the hindwings, etc. The white scaling of the forewings is more restricted than in *P. glycerion*, especially so on the underside, where it is conspicuous only in the anal region; almost the whole of the under surface of the forewings has, therefore, a glossy appearance.

Hab. Central China (8 ♂).

167. *Papilio mandarinus* Oberth. [♂, ♀].

Papilio glycerion var. *mandarinus* Oberthür, *Et. d'Ent.* IV. p. 115. sub n. 165 (1879) (Moupin; Kuy-Tseu).

Papilio mandarinus, Leech, *Batt. from China*, etc. p. 520 (1893) (W. China, common).

We distinguish a Chinese and an Indian subspecies of this insect:—

(a): *P. mandarinus* Oberth., forma typ. [♂, ♀].

A sketch of the underside of the hindwing, kindly sent to us by Mr. Charles Oberthür, shows that Mr. J. H. Leech was right in his supposition that *P. mandarinus* is not the Chinese representative of *P. glycerion* Gray.

This species is rather variable in pattern: the fourth cellular band of the forewings is very broad in one specimen from Chou-to-in-sa, in others from Moupin and Huang-nu-Chan it is only faintly marked, while in others again, from Wa-shan, it is entirely absent. The bases of the median nervules are mostly, but not always, black. The anal orange mark is often divided into two distinctly separated spots on the upperside.

Hab. Western China (14 ♂, 4 ♀).

Leech (*l.c.*) gives the description of *P. mandarinus paphus* Nicév., not that of *mandarinus* Oberth.

(b): *P. mandarinus paphus* Nicév. [♂, ♀].

Papilio paphus Nicéville, *Journ. As. Soc. Beng.* 55. p. 254. t. 11. f. 6 (♂) (1886) (Sikkim; O Moller): Elwes, *Tr. Ent. Soc. Lond.* p. 432. n. 425 (1888); Eimer, *Artbild. Schmett.* p. 46 f. c. & p. 66 (1889); Honrath, *Berl. Ent. Zeit.* XXXVI. *Sitz.-Ber.* p. 8 (1891) ("paphus Nicév. *bonerlanus* Oberth." *ex. err.*); Haase, *Unters. üb. Mon.* p. 31 (1893).

Papilio (Pathysa) paphus Nicéville, *Gazetteer of Sikkim* p. 174. n. 492 (1894) (Sikkim; May to July, 3000 to 7000 feet).

Though the North Indian *mandarinus* come very close to the Chinese ones, I can distinguish them by some characters which are not very prominent, but rather constant:—

The white scaling of the anal region of the upperside of the forewings, between inner margin and upper median nervule, is denser, and the wing, therefore, evidently

less transparent; the white portions of the costal margin in the apical half of the cell are covered with much narrower scales than in *P. mandarinus*; the black bands of the forewings are broader, especially the marginal and submarginal bands. On the hindwings, the subbasal black band is always interrupted behind the median nervure, owing to its being covered with white scales. In the *male* the abdominal fold, when opened out, shows much less black; the rudimentary scent-organ at the base of the fold is much whiter, and the scales composing it are obviously longer. Hairs of the front of the head longer.

While *P. mandarinus* is variable, its Indian representative is almost constant in its characters.

Hab. North India: Sikkim (10 ♂, 6 ♀; *incl. type!*); Nepal.

168. *Papilio alebion* Gray [♂].

Papilio alebion Gray, *Cat. Lep. Ins. B. M.* I. p. 30. n. 15. t. 13. f. 6 (1852) (Northern China); Feld., *Verh. z. b. Ges. Wien* p. 301. n. 183 (1864); Elwes, *P. Z. S.* p. 873 (1881); Haase, *Untersuch. üb. Min.* p. 31 (1893).

The *female* of this rare insect is unknown. My series of specimens does not exhibit any variation worthy of note.

(*a*²): *ab. mariesi* Butl.

Papilio mariesi Butler, *Ann. Mag. N. H.* (5). VII. p. 33. t. 4. f. 4 (1881) (Kiu-Kiang); Elwes, *P. Z. S.* p. 874 (1881).

Papilio alebion var. *mariesi* Leech, *Bull. from China*, etc. p. 522 (1893).

The black bands of the wings are very narrow; the submarginal black line of the forewings is almost entirely obliterated.

Hab. Kiu-Kiang (the only proper locality hitherto recorded) and North China (?) (6 ♂).

169. *Papilio tamerlanus* Oberth. [♂, ♀].

Papilio tamerlanus Oberthür, *Et. d'Ent.* II. p. 13. t. 2. f. 1 (1876) (Moupin); id., *l.c.* IV. p. 64. n. 164 (1879); Elwes, *P. Z. S.* p. 873 (1881) (*tamerlanus* = *alebion*?); Leech, *Bull. from China* p. 521 (♂, ♀) (1893) (fairly common in W. China).

Papilio alebion, Eimer, *Artbild. Schm.* p. 65. t. I. f. 1 (1889) (N. China).

The specimen figured by Eimer (*l.c.*) is *tamerlanus* Oberth. and not *alebion* Gray, and I do not believe that the patria "Nordchina" which Eimer gives to his *alebion* (not Gray's) is correct. This mistake in the identification accounts for his considering *tamerlanus* to be "ein einfacher *alebion*."

P. alebion and *tamerlanus* have the discoidal cell to the hindwings much broader, especially so in its apical half, than any other species of the present group.

The chief characters by which *P. alebion* and *tamerlanus* can be distinguished from each other are as follows:—

The hindwings of *P. alebion* are much more produced in the caudal region, and are, therefore, much narrower than those of *P. tamerlanus*; the anal yellow mark to the hindwings of *P. tamerlanus* is at least three times as broad (transversally) as long, and divided (or almost so) into two spots by the black lower median nervule, while in *P. alebion* that mark is about as long as broad (and therefore much larger than in *P. tamerlanus*), and not divided into two spots; the postcellular portions of the subbasal and median black lines, which form a very conspicuous angle on both

sides of the hindwings, are in *P. alebion* proportionally shorter than in *P. tamerlanus*.

Though I have seen a large number of specimens of *P. tamerlanus*, and have compared about twenty specimens of *alebion*, I have never met with intermediate examples. The shape of the hindwings and the yellow anal mark are so conspicuously different in *alebion* and *tamerlanus* that there is at present no reason to unite these *Papilio*s into one species.

Hab. Western China (13 ♂).

XXXI. ANTIPHATES-GROUP.

Similar to the preceding group, but the first discocellular vein of the forewings only a little, or not, longer than the second. Light bands in the apical region of the forewings with hairlike scales, exclusive of *P. ornatus* m. and *dorcus* De Haan. *Male* with long hairs at the abdominal margin of the hindwings; these hairs are concealed when the abdominal margin is folded in.

170. *Papilio antiphates* Cram. [♂, ♀, metam.].

Papilio Eques Achivus antiphates Cramer, *Pap. Ex.* I. p. 113. t. 72. f. A. B (1775) (China); Goeze, *Ent. Beytr.* III. 1. p. 78. n. 30 (1779); Fabr., *Ent. Syst.* III. 1. p. 24. n. 72 (1793) ("America" *loc. err.*).

Papilio Eques Achivus antipathes, Jablonsky & Herbst, *Naturs. Schmett.* III. p. 151. n. 98. t. 43. f. 1. & 2 (1858).

Iphiclides antiphates, Hübner, *Verz. bek. Schmett.* p. 82. n. 832 (1816).

Papilio pompilius, Godart, *Enc. Méth.* IX. p. 49. n. 70 (1819) (*p.p.*).

Papilio antiphates, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 15. n. 125 (1846) (*p.p.*); Gray, *Cut. Lep. Ins. B. M.* I. p. 31. n. 147 (1852) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 302. n. 185 (1864) (*p.p.*); Holland, *Tr. Amer. Ent. Soc.* XIV. p. 123. n. 81 (1887) (Hainan); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin).

Papilio pompilius Fabr. is a very doubtful species; Fabricius compares it with *P. sinon* Cram. from Jamaica, and gives in *Mant. Ins.* as a synonym *P. policeses* Cram. from Africa; this points to *P. nomius* Esp. or to a form of *P. aristeus* Cram. The description of *P. pompilius*, however, applies best to *P. antiphates* Cram., or a variety of it; but there is no character mentioned in the description that can give us a hint which special race of *P. antiphates* Fabricius had before him. The "hab. in India" points to the Indian race, which Fabricius had, however, already described under n. 65 as *Papilio E. A. alcibiades*; if *P. pompilius* really came from India, it must therefore be referred to *P. alcibiades* as a mere individual aberration. Doubtful as it is, it will be best to unite *P. pompilius* to the Indian race.

I can distinguish four local races of *P. antiphates* Cram.:—

(a): *P. antiphates* Cram. from Eastern China;

(b): *P. antiphates alcibiades* Fabr. from Continental India, Ceylon, Malay Peninsula, Sumatra, Nias, Java, Sambawa, Billiton, Natuna Islands, Bornco, Banguay;

(c): *P. antiphates decolor* Stauding. from Palawan, Mindanao, Banguay;

(d): *P. antiphates euphrates* Feld. from the Philippines.

(a): **P. antiphates** Cram., forma typ. [♂, ♀].

I have several examples from South-East China which agree very well with Cramer's figure, except in the black marginal band to the forewings, which only in

one of my examples reaches beyond the submedian nervure, and is here not so broad as in Cramer's figure.

The black bands on the forewings are broad, the two basal ones are extended far beyond the cell; on the upperside of the hindwings there are, besides the marginal black spots, between the discoidal nervules two or three well-marked black submarginal spots; the anal black mark is merged together with the greyish area of the caudal region in two specimens, just as it is shown in Cramer's figure. On the underside of the hindwings the subdiscal orange markings are of a rather deep colour, and the black spots outside them, as well as the discal black spots, are larger than in the Indo-Malayan form.

Hab. Eastern China (2 ♂, 2 ♀); Hainan (*this race?*).

(b): **P. antiphates alcibiades** Fabr. [♂, ♀, metam.].

- Papilio Eques Achirus alcibiades* Fabricius, *Mant. Ins.* II. p. 8. n. 65 (1787) (Tranquebar); id., *Ent. Syst.* III. 1. p. 25. n. 73 (1793).
- (?) *Papilio Eques Achirus pompilius* Fabricius, *Mant. Ins.* II. p. 8. n. 66 (1787) (India); id., *Ent. Syst.* III. 1. p. 25. n. 74 (1793).
- Iphicléides pompilius*, Hübner, *Verz. bek. Schmett.* p. 82. n. 839 (1816) (*p.p.*).
- Papilio antiphates*, Godart, *Enc. Méth.* p. 49. n. 71 (1819) (*p.p.*); Boisd., *Spec. Gén. Léop.* I. p. 248. n. 72 (1816) (Java; Bengal); Donbl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 15. n. 125 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M. I.* p. 31. n. 147 (1852); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 116. n. 232. t. 3. f. 10. 10a (*l., p.*) (1857); Vollenhov., *Tijdschr. v. Ent.* p. 77. n. 57 (1860); Felder, *Verh. z. b. Ges. Wien* p. 302. n. 185 (*p.p.*) & p. 346. n. 96 (1864); Wall., *Trans. Linn. Soc. Lond.* p. 63. n. 99 (1865); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Butler, *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 552. n. 1 (1877) (Mal. Pen.); Salv. & Godm., *P. Z. S.* p. 641 (1878) (Billiton I.); Moore, *ibid.* p. 841 (1878) (from Moulméin to Meetan); Oberthür, *Et. d'Ent.* IV. p. 63. n. 156 (1879); Wood-Mas. & Nicéy., *Journ. As. S. Beng.* p. 253. n. 101 (1881); Butler, *Ann. Mag. N. H.* (5). XVI. p. 342. n. 102 (1885) (Manipur); Weymer, *Stett. Ent. Zeit.* p. 273 (1885) (Nias); Dist. & Pryer, *Ann. Mag. N. H.* (5). XIX. p. 273. n. 177 (1887) (Sandakan); Piepers, *Tijdschr. v. Ent.* p. 349. t. 8. f. 4 (*l.*) (1888) (Java); Elwes, *Tr. Ent. Soc. Lond.* p. 433. n. 427 (1888) (Sikkim); common in the lower valleys up to 3000 feet, from April till October; Robbe, *Ann. Soc. Ent. Belg.* p. 126. n. 15 (1892) (Darjeeling).
- Papilio pompilius*, Godart, *l.c.* IX. p. 49. n. 70 (1819) (Java; *see* China); Horsf., *Cat. Lep. Ins. Mus. E. I. C. I.* t. 3 (*l.*) (1828) (Java); Lucas, *Léop. Exot.* p. 43. t. 22. f. 1 (1835).
- Podalirius pompilius*, Swainson, *Zool. Illustr.* (2). II. t. 105 (1833).
- Papilio antiphates* var. *pompilius*, Distant, *Rhop. Mal.* p. 357. n. 21. t. 31. f. 5 (♂) (1885); Hagen, *Berl. Ent. Zeit.* p. 155. n. 175 (1892) (Banka I.); id., *Iris* VII. p. 27. n. 32 (1894) (Sumatra).
- Papilio antiphates* var. *alcibiades*, Butler, *Cat. Diurn. Lep. Fabric.* p. 240. n. 22 (1869) (Java).
- Papilio (Pathysa) antiphates*, Wood-Mas. & Nicéy., *Journ. As. Soc. Beng.* p. 376. n. 188 (1886) (Cachar); Elwes & Nicéy., *ibid.* p. 437. n. 143 (1886) (Ponsekai); Doberty, *ibid.* p. 193 (1891) (Sambawa); Fergus., *Journ. Bombay N. H. Soc.* p. 445 (1891) (Travancore); Nicéy., *Gazetteer of Sikkim* p. 174. n. 493 (1894) (Sikkim); very common, up to 3000 feet).
- Papilio antiphates javanicus* Eimer, *Artbild. Schmett.* p. 136 (1888) (Java).
- Papilio antiphates*, Eimer, *l.c.* t. 2. f. 2 (1888) (Java).
- Pathysa antiphates*, Moore, *Journ. Linn. Soc. Lond.* XXI. p. 50 (1889) (Mergui); Swinh., *Tr. Ent. Soc. Lond.* p. 313. n. 392 (1893) (Khasia Hills; common).

Papilio alcibiades of Fabricius is certainly a form of *P. antiphates* Cram. Mr. A. G. Butler applied the name of *alcibiades* to a Javan specimen [*Cat. Diurn. Lep. Fabric.* p. 240. n. 22 (1869)], and I think he was quite right, as the character "*cauda atra apice albo*" is more often found in Javan specimens than in examples from other parts of Malayasia or Continental India, which mostly have "*cauda nigra margine albo*." The Javan *P. antiphates* are, however, not subspecifically separable from those from Sambawa, Sumatra, Nias, Bunguran, Borneo, Malacca, India, Ceylon, and so I have to treat all the *P. antiphates* from these localities as belonging to one subspecies, for which the name of *alcibiades* must stand.

Like the other local forms of *P. antiphates*, the Indo-Malayan race is very variable, and sometimes scarcely different from the Chinese form. The two basal black bands on the upperside of the forewings are mostly not prolonged beyond the median nervure; the marginal band seldom reaches the submedian vein; on the hindwings there are no submarginal black spots between the discoidal nervules; the anal black spot is widely separated from the greyish caudal region, and the black markings on the underside of the hindwings are rather small. But all these characters are highly variable, even in specimens from the same locality. I have about forty specimens from Thaiping, Malay Peninsula, which exhibit a good deal of variation.

If we consider the specimens with the tail (except its tip) and the caudal region of the hindwings of a deep black colour to be typical *P. antiphates albivales* Fabr. (see above), we must treat *P. antiphates javanicus* Eimer as a synonym of it, and there remain only the following named aberrations:—

(a²): ab. *nebulosus* Butl.

Papilio nebulosus Butler, *Ann. Mag. N. H.* (5). VII. p. 33. t. 4. f. 3 (1881) (Darjeeling); Nicéville, *ibid.* p. 385 (1881); Elwes, *ibid.* p. 469 (1881).

I have an example of this melanistic variety from Sikkim (Möller collection, I. vii. 86), which has the forewings black, with a submarginal white band reaching about the middle median nervule, and with four white bands extending from the costal margin to the median nervure.

(b²): ab. *continentalis* Eimer.

Papilio antiphates continentalis Eimer, *l.c.* p. 137 (1889).

Papilio antiphates Eimer, *l.c.* t. 2. f. 1. 3 (1889).

Caudal region of the hindwings suffused with black; subapical black band on the upperside of the forewings not posteriorly united to the black marginal border.

(c²): ab. *itamputi* Butl.

Papilio itamputi Butler, *Forbes' Natural Wanderer*. p. 276 (1885) (Sumatra).

Papilio antiphates itamputi, Eimer, *l.c.* p. 135 (1889).

Papilio antiphates, Snellen, *Tijdschr. v. Ent.* XXXIII. p. 221 (1890) (Sumatra); id., *Midden-Samatra*. II. p. 25. n. 2 (1892) (Sumatra).

Papilio antiphates var. *pompilius*, Hagen, *Iris* VII. p. 27. n. 32 (1894) (Sumatra).

Differs from the preceding aberration in having the marginal and the submarginal black bands on the upperside of the forewings united posteriorly.

This seems to be the usual form in Sumatra, but occurs also in other localities.

(d²): ab. *ceylonicus* Eimer.

Pathysa antiphates, Moore, *Lep. Ceyl.* p. 142. t. 63. f. 1. 1a (1881).

Papilio antiphates ceylonicus Eimer, *l.c.* p. 149 (1889) (Ceylon).

Two basal black bands on the upperside of the forewings extending beyond the median nervure; fourth band broad and reaching the median vein (not triangular). In these two characters ab. *ceylonicus* agrees with typical *antiphates*, from which it is distinguished by the greyish black caudal area of the upperside of the hindwings being very much restricted.

Hab. Ceylon (1 ♂); South and Central India: Assam (4 ♂); Sikkim (15 ♂, 1 ♀); Burma; Shan States (9 ♂); Malacca (41 ♂, 1 ♀); Sumatra (5 ♂); Nias; Java (6 ♂); Sambawa (2 ♂, 1 ♀); Bunguran (2 ♂); Borneo (5 ♂); Banguey (1 ♂).

The above-enumerated aberrations are to be found in series from every locality, except ab. *nebulosus*, which has only twice occurred, and both times in Sikkim.

While in *P. antiphates* Cram. and *P. antiphates alcibiades* Fabr. the median black streak on the underside of the hindwings extends beyond the median vein into the middle median cellule, this streak stops at the median nervure in the following races of *P. antiphates* (and, I may add, in the Celebesian *P. androcles* Boisd.).

(c): **P. antiphates decolor** Standing. [♂, ♀].

Papilio antiphates var. *decolor* Standing, *Iris* I. p. 279 (1888) (Palawan); id., *l.c.* II. p. 13 (1889).
Papilio (Pathysa) antiphates form *C. decolor*, Semper, *Philipp., Tagfalt.* p. 285. t. 48. f. 3 (♂) (1893).
Papilio antiphates palawanicus Eimer, *l.c.* p. 149 (1889) (*nomen novum superfluum*).

The rather narrow black border to the hindwings is not interrupted at the veins, and there is no white marginal border. The fourth black streak on the forewings is very short; the marginal band to the forewings reaches the submedian vein or not.

(e²): ab. *tigris* Semper.

Papilio antiphates form *B. tigris* Semper, *Philipp., Tagfalt.* p. 284. t. 48. f. 2 (♀) (1893) (S.E. Mindanao).

The hindwings have the subbasal black streak of the underside also present on the upperside between the costal and median nervures; caudal grey area rather large.

(f²): ab. *euphratooides* Eimer.

Papilio antiphates euphratooides Eimer, *l.c.* p. 133. t. 2. f. 4 (1889).
Papilio (Pathysa) antiphates form *A. euphratooides*, Semper, *l.c.* p. 284. t. 48. f. 1 (♀) (1893) (Camiguin; Mindanao).
Papilio euphrates, Oberthur, *Et. d'Ent.* IV. p. 63. n. 155 (1879) (Mindanao).

Similar to *decolor*, but the hindwings have a white fringe between the nervules.

Hab. Palawan (5 ♂); Mindanao (1 ♂); Camiguin; Borneo (?) (2 ♂); Banguey Island (1 ♂).

There are two specimens in the Felder collection labelled "Borneo" which are rather larger than the Palawan examples, but are otherwise identical with them. On Banguey Island *decolor* and *alcibiades* occur together.

(d): **P. antiphates euphrates** Feld. [♂, ♀].

Papilio euphrates Felder, *Wien. Ent. Mon.* VI. p. 283 (1862) (Luzon); id., *Verh. z. b. Ges. Wien* p. 302. n. 186 (1864); id., *Reise Novara, Lep.* I. p. 54. n. 41. t. 11. f. d (1865); Wall., *Trans. Linn. Soc. Lond.* XXV. p. 63. n. 100 (1865); Eimer, *Artbild. Schmett.* p. 125. n. 2. t. 2. f. 5 (1889).
Papilio moorei Reakirt, *Proc. Ent. Soc. Phil.* p. 485 (1864) (Philippines).
Papilio (Pathysa) antiphates var. *euphrates*, Semper, *Philipp., Tagfalt.* p. 285. form E. t. 48. f. 6 (♀) & f. 4. 5 (♂, ♀, var.) (1893) (Luzon; Mindoro; Domaran; Bohol).

Comparing the various forms described and figured by Semper (*l.c.*) with my material from Palawan and the Philippines, I come to the conclusion that the specimens from Mindanao and Camiguin must be referred to *P. antiphates decolor* Standing, if they do not represent a local form by themselves (which then has to stand as *P. antiphates euphratooides* Eimer), while the other islands are inhabited by *P. antiphates euphrates* Feld.

The marginal and submarginal black bands to the forewings of *P. antiphates euphrates* are very broad; they merge together at about the middle median nervule,

and are still of considerable breadth at the inner margin of the wing. The other bands of the forewings are also broad; the fourth reaches the median vein. On the hindwings the anal and the submarginal black spots are confluent with the broad black border of the wing.

(*g*²): ab. loc. *atratus* ab. nov.

The marginal and submarginal black band to the forewings, as well as the black border of the hindwings, are broader than in *euphrates*; the hindwings have on the upperside a black streak, as it is present in *decolor* ab. *tigris*; the black as well as the orange markings in the anal region of the underside of the hindwings are larger and of a deeper colour, and the black dorsal stripe of the abdomen is broader in both sexes.

This aberration occurs in Mindoro [and (according to Semper) in Bohol?].

Hab. Luzon (6 ♂, 1 ♀); Mindoro (1 ♂, 1 ♀); Domaran; Bohol.

171. *Papilio epaminondas* Oberth. [♂, ♀].

Papilio antiphates, Moore (*in* Cramer, 1775), *P. Z. S.* p. 593 (1865) (Pt. Blair; Andaman Is.).

Papilio epaminondas Oberthur, *Et. d'Ent.* IV. p. 62, n. 154, t. 4, f. 1 (1879) (Andamans); Stauding.

& Schatz, *Exot. Schmett.* p. 9, t. 6 (♂) (1888); Eimer, *Arthild. Schmett.* p. 121, t. 2, f. 6 (1889).

Papilio laestrygonum Wood-Mason, *Proc. As. S. Beng.* p. 102 (1880, June) (Andaman Is.); id.,

Journ. As. S. Beng. p. 178, pl. 6, f. 1, & 1a (♂) (1880) (And. Is.); id. & Nicéy, *l.c.* p. 238.

n. 72 (1880) (And. Is.); id., *l.c.* p. 253, n. 102 (1881) (*descr. of* ♀).

Though this species is very variable, and comes often rather close to typical *P. antiphates* Cram., I have not seen any examples in which the discal black markings on the upperside of the hindwings are entirely obliterated. The anal ochreous spot on the hindwings is always of a much deeper colour than in any race of *P. antiphates*. I have not seen examples from the Nicobar Islands, nor is *P. antiphates* recorded from there.

Hab. Andaman Islands (10 ♂).

172. *Papilio ornatus* sp. nov. [♂].

♂. Wings shaped as in *P. antiphates alcibiades* Cram.; body coloured as in *P. antiphates euphrates* Feld.

Upperside. Forewings: marginal black band rather narrow, not reaching the submedian vein, separated from the submarginal black band, which stops usually at the second median nervule or extends a little beyond it, by means of a white macular band, which is densely suffused with black between the lower discal and the middle median veins, so that the marginal and submarginal black bands appear to be more or less merged together posteriorly. The submarginal black band is broad at the costal margin, strongly and almost evenly narrowed behind, and concave at its discal side; in some specimens it is notched in the cellule formed by the lower subcostal and upper discoidal veins. Discoidal cell with five black streaks, of which the apical one reaches to the origin of the second discoidal nervule, while the others reach the median nervule or not; none of the streaks extend beyond the cell; they are partly dusted with white scales posteriorly; the subbasal streak is very feeble.

Hindwings: the black border is of a very deep colour; at the upper median nervule it extends not quite half-way from the outer margin to the cell; anteriorly it becomes gradually narrower, includes a submarginal white lunule between the two upper discoidal veins, and is often interrupted at the subcostal nervule; the black

spot at the anal angle is mostly joined to the black border of the wing; at the anal sinus there stands a white (not yellow) marginal spot; tails thinly bordered with white, the white colour not or a very little more pronounced at the tip of the tail.

The whole of the upperside, including the subapical white band, is covered with both layers of scales.

Underside: forewings as above, but with the base of the cell green, which colour shows often through on the upperside, and the apical third of the wing often tinged with buff. The submarginal white or buffish white band is not, or very feebly, suffused with black posteriorly, thus separating the marginal and submarginal black bands for the whole length; the nervules traversing it much thinner black. The cellular black bands longer and mostly broader than above; the second (counted from the base) extends beyond the median nervure.

Hindwings with the same markings as in *P. antiiphates* Cram. The abdominal and subbasal black lines, which are joined to one another posteriorly, are scarcely broader than in *P. antiiphates*; the median black band is about half as broad again as these lines, or broader; it is also joined posteriorly to the extremity of the abdominal and subbasal lines by means of two, mostly ill-defined, black spots situated between the upper and lower median nervules; the discal series of black spots, standing outside the median band and ending with the anal black mark, consists of very large patches, which are connected with the median band and touch each other; the black spot in the apex of the cell not larger than in *antiiphates* Cram.; the anal black mark is clearly separated from the end of the abdominal black line; the submarginal black markings, which in *P. epaminondas* Oberth. are so well separated from the marginal spots, are larger and less irregular than in that species; the three anterior ones stand separate, the fourth is joined to the marginal spot, extends along the upper median vein, and reaches (or almost so) the corresponding discal black spot; the two posterior ones, standing between the median veins, are merged together with the marginal spots, the whitish markings bordering them exteriorly in *P. antiiphates* being seldom slightly marked. The yellow scaling inside the submarginal black spots in *P. epaminondas* forms here two or three yellow spots in the caudal region; the two posterior ones are entirely (or almost so) enclosed in black, and are thus rendered very conspicuous.

♀. Unknown.

Hab. Halmahera (W. Doherty, August 1892) (8 ♂).

I should not have ventured to treat this insect as distinct from *P. antiiphates* Cram., if it were not for the scaling of the upperside of the forewings, which is remarkably different from that of *antiiphates* and its races. In *P. antiiphates*, *epaminondas*, and *androcles* the upper scales on the light parts of the forewings above, in the costal and apical region, have developed into short hairs, and the under scales are obliterated, while in *P. ornatus* m. the scales of both layers are present all over the wing and do not assume the character of hairs.

As in respect to pattern no character appears in *P. ornatus* which is altogether new, all the distinguishing points being modifications of the characters of *antiiphates*, and as, further, the scaling of many *Papilio*s varies under the influence of altered conditions of life (compare *P. agamemnon* and its races, *P. podalirius*), I think it possible that a connecting link between *ornatus* and *antiiphates* will be found.

Note.—Prof. Eimer, *l.c.* p. 142, says that the races of *P. antiiphates* Cram. are inclined to assume a greenish tint on the upperside of the wings, especially in the

apical region of the forewings. This greenish tint is, as stated above, due to the scaling being partly obliterated and partly hairlike, and therefore being not able to conceal the greenish membrane of the wing. According to Prof. Eimer, the present *Papilio ornatus* Rothsch. must, therefore, be an ancient form, as the wings have not yet assumed the greenish tint in the apical region. As the black bands of the forewings above are inclined to be obliterated more and more from the posterior side, we learn from Prof. Eimer, *l.c.* pp. 143, 145, etc., that *P. ornatus* is a recent form of the *antiphates*-group. The present insect combines therefore a character which points (acc. to Eimer) to the ancestral form of the group, and which is not preserved in the allied forms, together with the recently acquired reduction of the black bands on the forewings. This latter character of *P. ornatus* is more developed even than in the Indian *P. antiphates albibiades* Fabr., which Eimer considers to be the most advanced and recent subspecies of *P. antiphates* Cram. in respect to the pattern of the wings.

In the Malayan race (*insularis* Standing.) of *P. agetes* Westw. we meet with a similar combination of characters, reduction of bands and condensation of scaling, while on the contrary a reduction of bands and reduction of scaling go hand in hand in other species, for example in *P. podalirius feisthameli* Dup. *Papilio dorcus* De Haan, which has more black on the wings than its ally *P. androcles* Boisid., though the number of the black bands is reduced, differs from *androcles* also in the greater density of the scaling.—K. J.

173. *Papilio androcles* Boisid. [♂].

Papilio androcles Boisduval, *Spec. Gén. Léop.* 1. p. 249. n. 73 (1836) (Celebes) : De Haan, *Verh. Nat. Ges. Ned. overz. bez., Zool.* p. 35 (1840) ; Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 15. n. 140 (1846) ; Feld., *Verh. z. b. Ges. Wien* p. 302. n. 187 (1864) ; Wall., *Tr. Linn. Soc. Lond.* XXV. p. 63. n. 101. t. 7. f. 5 (♂) (1865) (Macassar) : Snellen, *Tijdschr. v. Ent.* p. 37. n. 148 (1877) (Amparang ; Bonthain) ; Oberth., *Et. d'Ent.* IV. p. 61. n. 153 (1879) ; Standing. & Schatz, *Exot. Schmett.* I. p. 9 (1888) ; Eimer, *Artbild. Schmett.* p. 140. t. 2. f. 7 (1889) ; Rothschi., *Iris* p. 442 (1892).

The scent-organ within the abdominal fold of the *male* is more developed than in *P. antiphates* Cram. The *female* of this rather constant species is still unknown.

Hab. Celebes (W. Doherty : South Celebes, August to September 1892) (16 ♂).

174. *Papilio dorcus* De Haan [♂].

Papilio dorcus De Haan, *Verh. Nat. Ges. Ned. overz. bez., Zool.* p. 35. t. 7. f. 4 (1840) ; Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 16. n. 141 (1846) ; Vollenh., *Tijdschr. v. Ent.* III. p. 77. n. 61 (1860) ; Feld., *Verh. z. b. Ges. Wien* p. 302. n. 188 (1864) ; Wall., *Tr. Linn. Soc. Lond.* XXV. p. 64. n. 102 (1865) (Gorontalo, N. Celebes) ; Standing. & Schatz, *Exot. Schmett.* I. p. 9 (1888) ; Eimer, *Artbild. Schmett.* p. 141. t. 2. f. 8 (1889).

♂. This rare species is somewhat of a connecting link between the *aristeus*-group and the *antiphates*-group. In scaling and in pattern it agrees best with the *aristeus*-group, while in general form and appearance it is close to *P. androcles* of the *antiphates*-group. The submarginal white or greenish white band present on the forewings in all the allied species is in *P. dorcus* extremely feebly indicated, and only on the underside.

In one of my specimens there is a black spot on the subcostal nervure on the upperside of the forewings, just outside the second black band, indicating the third (abbreviated) band of *P. androcles* Boisid.

♀. Unknown.

Hab. Celebes (3 ♂).

XXXII. AGETES-GROUP.

Agrees with the preceding group, but the *males* have a rather large cottony scent-organ within the abdominal fold.

175. *Papilio agetes* Westw. [♂].

Papilio agetes Westwood, *Arr. Ent.* II. p. 23. t. 55. f. 1. 2 (1843) (Ind. or., Sylhet?); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 15. n. 123 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 31. n. 145 (1852); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 116. n. 233 (1857) (Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 302. n. 184. & p. 346. n. 94 (1864); Oberth., *Et. d'Ent.* IV. p. 67. n. 185 (1879) (Sylhet); Standing. & Schatz, *Exot. Schmett.* p. 9 (1884); Distant, *Rhop. Mal.* p. 469. n. 31. t. 42. f. 8 (1886) (Perak); Elwes, *Tr. Ent. Soc. Lond.* p. 433. n. 426 (1888) (Sikkim; Sivoke); Eimer, *Artbild. Schmett.* p. 53. 113. t. 1. f. 8 (1889); Hase, *Unters. üb. Min.* p. 32 (1893); Oberth., *Et. d'Ent.* XVII. p. 5 (1893) (Tonkin).

Papilio (Pathysa) agetes, Elwes & Nicéy., *Journ. As. Soc. Beng.* p. 437. n. 144 (1886) (Ponsekai).

Pathysa agetes, Swinhoe, *Tr. Ent. Soc. Lond.* p. 313. n. 391 (1893) (Khasia Hills).

Two local forms:—

(a): *P. agetes* Westw. [♂].

♂. This species is fairly constant. The length and breadth of the black bands is slightly variable; the two basal black bands on the forewings often reach the inner margin of the wing; the number of red linear spots in the black median band on the underside of the hindwings is sometimes reduced.

♀. Undescribed; unknown to me.

Hab. Sikkim (lower hills: 8 ♂); Assam (5 ♂); Shan States (7 ♂); Malay Peninsula; Tonkin.

(b): *P. agetes insularis* Staudinger. [♂].

Papilio agetes, Hagen (*nee* Westwood, 1843), *Iris* VII. p. 27. n. 31 (1894) (Sumatra; "nicht ueter 3000 Fuss Meereshöhe").

Papilio agetes Webst. (*sic*) var. *insularis* Staudinger, *Iris* VII. p. 349 (1895) (Sumatra; Kina Balu, N. Borneo).

Differs from *P. agetes* Westw. in the following characters: the two basal black bands on the upperside of the forewings are shorter, the first reaches the submedian nerve, the second stops at the median vein or is only a very little extended beyond it; the fourth band, at the apex of the cell, is broader than in *P. agetes*, more or less triangular, and extended as far as the origin of the middle discoidal nervule; the submarginal and marginal bands are a little broader, and the light space between them somewhat smaller, than in *P. agetes*. The anterior half of the cell to the forewings has two layers of scales in *insularis*, while in *P. agetes* the under scales are all, or nearly all, obliterated.

Hab. Kina Balu, British North Borneo (2 ♂); Sumatra (1 ♂).

In the scaling of the forewings and reduction of the basal black bands this local form comes nearer to the following species (*P. stratiotes* Grose Smith) than to *P. agetes* Westw., with which it agrees in all the other characters.

176. *Papilio stratiotes* Grose Smith [♂].

Papilio stratiotes Grose Smith, *Ann. Mag. N. H.* (5). XX. p. 433 (1887) (Kina Balu); Honrath, *Berl. Ent. Zeit.* XXXI. p. 349. t. 6. f. 3 (1888); Eimer, *Artbild. Schmett.* p. 151. f. p (1889).

The interior one of the two black lines on the underside of the hindwings is straight and is in the same position as in *P. antiophates* Cram., while in *P. agetes*

Westw. this line forms a kind of angle. In all the other characters *P. stratiotes* Grose Smith comes nearest to *P. agetes*, and is very different from *P. antiphates*, to which Professor Eimer links it. *P. stratiotes* and *agetes* form a separate group, though close to the *antiphates*-group; Professor Eimer, misled by a superficial resemblance in the pattern of the wings, placed *P. agetes*, together with a number of American species, and *podalirius*, *albion*, *glycerion*, etc., into his *podalirius*-group, with which, however, *agetes* has nothing to do.

Hab. Kina Balu, North Borneo (8 ♂).

XXXIII. ARISTEUS-GROUP.

Differs from the *antiphates*-group in the white bands of the wings being normally sealed, and in the *males* having a cottony scent-organ, as in the *agetes*-group.

177. *Papilio aristeus* Cram. [♂, ♀].

- Papilio Eques Achirus aristeus* Cramer, *Pap. Ec.* IV. p. 60. t. 318. f. E. F (1782) (Amboina); Jablonsky & Herbst, *Naturs. Schmett.* III. p. 156. t. 44. f. 3. 4 (1884).
Iphiclidus aristeus, Hübnér, *Verz. hel. Schm.* p. 82. n. 837 (1816).
Papilio aristaeus, Godart, *Enc. Méth.* IX. p. 51. n. 76 (1819) (Amboina: "Java" *loc. err.*); Boisd., *Spec. Gén.* p. 252. n. 76 (1836) (Amboina; "Celebes" *loc. err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 118 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 29. n. 138 (1852); Vollenh., *Tijdschr. v. Ent.* III. p. 77. n. 59 (1860) (Amboina); Feld., *Verh. z. b. Ges. Wien* p. 302. n. 191. & p. 346. n. 99 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 64. n. 104 (1865) (Ceram; Batjan); Oberth., *Et. d'Ent.* IV. p. 63. n. 160 (1879) (Ceram; Amboina); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 203 (1884); Standing., *Iris* II. p. 15 (1889); Eimer, *Artbild. Schmett.* p. 167. t. 3. f. 5 (1889); Ribbe, *Iris* II. p. 210. n. 10 (1890) (Ceram).
Papilio timocrates Felder, *Reise Novara, Lep.* I. p. 55. n. 42 (1865) (Halmahera).

In typical *P. aristeus* Cram., as well as in the various local forms, the wings vary somewhat in the amount of black; the palest races are *anticrates* from Continental India and *parmatius* from Queensland and New Guinea. The dark bands are almost of the same black colour on both sides of the wings in the Moluccan race, *i.e.* in typical *P. aristeus*; in the other three subspecies the bands are, on the underside of the wings, of a more or less pale cinnamon colour. The collar bears an ochreous spot on each side in the two Papuan races (*aristeus* and *parmatius*).

The four races of *P. aristeus* Cram. are distributed as follows:—

- (a): *P. aristeus* Cram. occurs in the Moluccas;
- (b): *P. aristeus parmatius* Gray occurs in Queensland, New Guinea, Aru, and Waigeu;
- (c): *P. aristeus anticrates* Doubl. occurs in Northern India;
- (d): *P. aristeus hermocrates* Feld. occurs in the Philippine Islands, Palawan, Borneo, Sumatra, Malacca, Tenasserim, Burma, Tonkin, Timor, and Wetter.

In Celebes *P. aristeus* Cram. is replaced by a closely allied species, *P. rhesus* Boisd., and in the Bismarck Archipelago by *P. paron* Godm. & Salv.

(a): **P. aristeus** Cram., forma typ. [♂].

Female not described.

Is apparently rare. The Halmahera specimens are separated by Felder under the name of *P. timocrates*, but I cannot find that they are really different from those

from the Southern Moluccas. My three Batjan specimens and two Halmahera examples have rather more white on the hindwings than the Ceram individuals. Felder's two Halmahera specimens agree in the amount of white, however, with the Ceram examples.

Hab. Amboina; Ceram (2 ♂); Batjan (3 ♂); Halmahera (4 ♂).

(b): ***P. aristeus parmatum*** Gray [♂, ♀].

Papilio parmatum Gray, *Cat. Lep. Ins. B. M.* l. p. 30. n. 141. t. 3. f. 2 (1852) (Australia); id., *List Lep. Ins. B. M.* l. p. 41. n. 148 (1856) (Australia); Feld., *Verh. z. b. Ges. Wien* p. 302. n. 192 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 64. n. 105 (1865) (Aru; Waigeu; Australia); Oberth., *Et. d'Ent.* p. 63. n. 157. (1879); Mislin, *Proc. Roy. Soc. Queensl.* IV. p. 17 (1887) (Mackay); Standing., *Iris* l. p. 15 (1889) ("Sikkim" *ver errore*); Lucas, *Proc. Roy. Soc. Queensl.* VIII. p. 68 (1892) (Yeppoon).

Papilio aristeus, Pagenstecher, *Jahrb. Nass. Ver. Nat.* p. 203 (1884) (*p.p.*; Australia); Ribbe, *Iris* II. p. 210. sub n. 10 (1890) (*p.p.*; Australia).

Papilio anticrates, Eimer, *Artbild. Schmett.* p. 170 (1889) (*p.p.*).

Papilio anticrates var. *parmatum*, Eimer, *l.c.* t. 3. f. 7 (1889).

Papilio pherecrates Felder, *Verh. z. b. Ges. Wien* p. 302. n. 193 (1865) (*nomen nud.*); id., *Reise Novara*, *Lep.* I. p. 56. n. 43 (1865) (Nov. Guinea).

Papilio parmatum subsp. *guineensis* Grose-Smith, *Nor. Zool.* I. p. 333. n. 10 (1894) (Humboldt Bay).

Spot on each side of the prothorax deeper yellow than in the other races. The median black band on the upperside of the hindwings is, in specimens from the same locality, complete, or broadly interrupted in the middle, or entirely absent.

The postcellular white area on the forewings is much broader than in *P. aristeus* Cram., and in this respect *parmatum* agrees with *anticrates* Doubl. from India.

Felder's *P. pherecrates* from New Guinea is not distinguishable from *parmatum*. In the Felder collection there is only a single specimen under the name of *P. parmatum* Gray, which is labelled "Austral. Cap. York, coll. Deyrolle"; this specimen is certainly not *P. parmatum*, but *P. anticrates* Doubl., as it exhibits all the characters which distinguish *P. aristeus anticrates* Doubl. from *P. aristeus parmatum* Gray.

Eimer (*l.c.*) unites *parmatum* with *anticrates*; though both are closely allied, they can be separated as follows:—

In *anticrates* the white submarginal lunules are larger, the dark bands on the under surface of both wings much paler ochreous, than in *parmatum*, whereas the latter form exhibits the above-mentioned two conspicuous ochreous spots on the prothorax, which are absent or scarcely indicated in *anticrates*. Most of the specimens of *anticrates* have on the forewings, at the apical side of the white band situate outside the discocellular nervules, a white spot which is absent from all the other forms of *P. aristeus*. This additional spot is present in Felder's specimen above referred to.

Hab. Queensland (6 ♂, 4 ♀); New Guinea (4 ♂); Aru Islands; Waigeu (2 ♂).

(c): ***P. aristeus anticrates*** Doubl. [♂, ♀].

Papilio anticrates Doubleday, *Ann. Mag. N. H.* XVIII. p. 371 (1846) (Sylhet); Doubl. Westw. & Hew., *Gen. Dipt. Lep.* p. 14. n. 120 (1846); Gray, *Cat. Lep. Ins. B. M.* l. p. 29. n. 140. t. 3. f. 3 (1852) (Sylhet); id., *List Lep. Ins. B. M.* l. p. 41. n. 147 (1856) (Sylhet); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* l. p. 115. n. 231 (1857) (Darjeeling); Felder, *Verh. z. b. Ges. Wien* p. 302. n. 190 (1864) (Sylhet; Darjeeling); Moore, *P. Z. S.* p. 759 (1865); Elwes, *Tr. Ent. Soc.* p. 434. n. 428 (1888) (Sikkim; rare in the lowest valleys; abundant at Sivoke; ♀ described); Eimer, *Artbild. Schmett.* p. 170 (*p.p.*) t. 3. f. 6 (1889).

Papilio anticrates var. *parmatum*, Eimer, *l.c.* t. 3. f. 8 (1889).

Pathysa anticrates, Swinboc, *Tr. Ent. Soc. Lond.* p. 313. n. 393 (1893) (Khasia Hills; great numbers).

Papilio (Pathysa) anticrates, Nicéville, *Gazetteer of Sikkim* p. 174. n. 495 (1891) (Sikkim; single-brooded; at Sivoke in April and May very common).

In my series of seventeen specimens from Sikkim the median black band on the upperside of the hindwings varies from being almost complete to being almost entirely absent. The Sikkim specimens are not subspecifically distinguishable from the Assam examples. The before-mentioned band is complete, as in the next subspecies, in a specimen from the Garo Hills (Assam). The two white bands inside and outside the discocellular nervules on the forewings are sometimes connected with one another at the costal margin. In an Assam specimen the fifth black band on the forewings (the fourth, if counted from the apex of the wing) is very much abbreviated and extends from the costal margin scarcely half-way to the median nervure. The posterior and anterior red spots of the median row on the underside of the hindwings are sometimes feebly marked on the upperside.

Hab. Assam (11 ♂); Sikkim (15 ♂, 2 ♀).

(d) : ***P. aristeus hermocrates*** Feld. [♂, ♀].

Papilio hermocrates Felder, *Verh. z. b. Ges. Wien* p. 302. n. 194 (1864) (*nom. nud.*); id., *Reise Nov.*, *Lep.* I. p. 57. n. 44. t. 12. f. E (♂) (1865) (Luzon); Oberth., *Et. d'Ent.* IV. p. 63. n. 156 (1879) (Mindanao); Stauding., *Iris* I. p. 14 (1888) (Palawan); id., *l.c.* II. p. 14 (1889) (Palawan; ♀ *notic.*); Eimer, *Arb. bild. Schm.* p. 161. t. 3. f. 2 (1889); Oberth., *Et. d'Ent.* XVII. p. 1 (1893) (Tonkin).

Papilio anticrates, Distant, *Rhop. Mal.* p. 470. n. 32. t. 42. f. 7 (1886) (Perak); Hagen, *Iris* VII. p. 27. n. 30 (1894) (Gajo country, Sumatra).

Papilio (Pathysa) hermocrates, Elwes & Nicéville, *Journ. As. Soc. Beng.* p. 437. n. 146 (1886) (Tavoy & Siam); Semper, *Philipp., Tagfall.* p. 283. n. 413 (1892) (Luzon; Cebu; Mindanao).

In the amount of black on the upperside of the wings this form comes nearest to *P. aristeus* Cram. The black band situated upon the discocellular nervules of the forewings is posteriorly mostly joined to the submarginal black band, thus separating the short white streak outside the end of the cell from the postcellular white area. The median band on the upperside of the hindwings is always present. The breadth of the black bands is very variable.

Prof. Eimer (*l.c.*) distinguishes four forms (which, in my opinion, all belong to *hermocrates*): *P. hermocrates* Feld., *P. aristoides* Eimer, *P. aristeus* var. *nigricans* Eimer, and *P. anticrates* var. *nigricans* Eimer.

P. hermocrates is described by Felder from a specimen with rather much white on the wings; in Eimer's *aristoides* the white colour is more reduced, in his *P. anticrates* var. *nigricans* even more so, and in what he calls *aristeus* var. *nigricans* the black colour is so prevalent that the basal white band on the underside of the hindwings has disappeared. *P. aristoides* Eimer is not a species, as there are all intergraduate specimens between it and typical *P. hermocrates*, and it is not a local form, as it occurs all over the whole of the area occupied by *P. hermocrates*. *P. anticrates* var. *nigricans* must be referred to *P. hermocrates*, not to *anticrates*, as its characters (the habitat is unknown) agree with the first. *P. aristeus* var. *nigricans* has, according to Eimer, the underside of the wings golden brown, not black, and therefore cannot be a variety of *P. aristeus* proper, but must also belong to *hermocrates*. So we have four names for *P. aristeus hermocrates*, of which two are identical (*nigricans*); as the most aberrant *nigricans* is the first described, it is not necessary to rename the second *nigricans*.

(a²): ab. *aristeoides* Eimer.

Papilio aristeoides Eimer, *l.c.* p. 163. t. 3. f. 3 (1889) (N. Burma); Staudinger, *Lvs* 11. p. 15 (1889). Semper, *Philipp., Tayfult.* p. 283. sub n. 413 (1893).

The white bands narrower than in typical *hermoerates* Feld.

(b²): ab. *nigricans* Eimer.

Papilio aristeus var. *nigricans* Eimer, *l.c.* p. 168. f. 11 (1889) (hab.?).

Papilio anticrates var. *nigricans* Eimer, *l.c.* p. 175. f. 11 (1889) (N. Burma).

This melanistic variety corresponds with *P. antiphates* ab. *nebulosus* Butl.

Hub. Philippines (2 ♂); Palawan (4 ♂); Borneo (3 ♂); Sumatra; Malay Peninsula; Tenasserim; Burma (2 ♂); Timor (2 ♂); Wetter (1 ♂).

I have two specimens from Timor (W. Doherty, November to December 1891), which are rather smaller and have the forewings shorter than the specimens of *P. aristeus hermoerates* from other localities; in the amount of white on the upperside they stand intermediate between *hermoerates* and *parmatus*, while the underside has the darker tint of *parmatus*.

A specimen from Wetter (W. Doherty, May 1892) almost exactly agrees with a small Palawan specimen of ab. *aristeoides*, but the forewings are also in this Wetter specimen as short as in those from Timor. I think three specimens, which are not identical with one another, too poor a material to propose a subspecific name for.

178. *Papilio nominis* Esp. [♂, ♀, metam.].

(?) *Papilio Eques Achirus orestes* Fabricius, *Ent. Syst.* III. 1. p. 34. n. 99 (1793) (Africa!).

Papilio Eques Achirus nominis Esper, *Aust. Schmett.* p. 210. t. 52. f. 3 (1785-98; post 1793) ("S. America" *loc. err.*).

Princeps heroicus meges Hübner, *Samul. Ex. Schmett.* I. t. 106 (1806-24).

Lphiclides meges Hübner, *Verz. bek. Schmett.* p. 82. n. 833 (1816).

Papilio nominis Godart, *Enc. Méth.* IX. p. 51. n. 75 (1819) ("America" *loc. err.*); Swains., *Zool. Illustr.* (2). II. t. 32 (1831-33) ("S. Brazil" *loc. err.*).

Papilio nominis, Boisduval, *Spec. Gén. Léop.* I. p. 251. n. 75 (1836) (Bengal?); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 119 (1846) (N. India); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 115. n. 230 (1857) (N. India); Moore, *P. Z. S.* p. 578 (1867) (Bengal); Oberth., *Et. d'Ent.* IV. p. 63. n. 161 (1879) (N. India); Standing. & Schatz, *Écot. Schmett.* I. p. 9 (1884); Eimer, *Artbild. Schmett.* p. 164. t. 3. f. 4 (1889); Davids. & Aitk., *Journ. Bombay N. H. Soc.* p. 364. t. E. f. 1 (*l.*), 1a (*p.*) (1890) (life hist.); Betham, *ibid.* p. 330 (1891) (Central Prov.).

Papilio orestes, Boisduval, *Spec. Gén. Léop.* I. p. 378 (1836); Westw., *Arr. Ent.* I. p. 154 (1845); Gray, *Cat. Lep. Ins. B. M. I.* p. 29. n. 139 (1852) (N. India); id., *List Lep. Ins. B. M. I.* p. 40. n. 146 (1856) (N. India); Vollenhov., *Tijdschr. v. Ent.* III. p. 77. n. 58 (1860) ("Brazil" *loc. err.*); Feld., *Verh. z. b. Ges. Wien* p. 302. n. 189 (1864) (Patria?); Butl., *Cat. Lep. Ins. descr. Fabric.* p. 240. n. 23 (1869) (Barraekpore, India).

Papilio orestes var., Felder, *Verh. z. b. Ges. Wien* p. 302. n. 189. & p. 346. n. 98 (1864) (Cascmir; Darjeeling).

Pathysa nominis, Moore, *Lep. Ceylon* I. p. 142. t. 62. f. 2 (1881) (Ceylon); Swinh., *Tr. Ent. Soc. Lond.* p. 313. sub n. 393 (1893) (not received from the Khasia Hills).

Papilio (Pathysa) nominis, Nicéville, *Journ. As. Soc. Beng.* p. 51. n. 125 (1885) (Calcutta); Hamp., *ibid.* p. 364. n. 207 (1888) (Nilgiri Hills; 1 specimen); Fergus., *Journ. Bombay N. H. Soc.* p. 446. n. 169 (1891) (Travancore, 1 specimen); Nicé., *Gazettes of Sikkim* p. 174. n. 496 (1894) (Sikkim; a single straggler).

According to Jones's unpublished drawings, *P. orestes* Fabr. belongs either to this species or to *P. aristeus anticrates* Doubl. The type of *P. orestes* Fabr. was probably a mutilated specimen, hence the character "*alis subbeaudatis*." As it is

impossible to make out with certainty what *P. orestes* Fabr. really was, I cannot follow Gray and others in applying the name of *orestes* to our present *Papilio*, though that name is older than Esper's name of *nomius*.

P. nomius Esp. is very closely allied to *P. aristeus* Cram., with which it flies together in Burma and Tonkin. The differences are indeed insignificant. The two lower median nervules to the hindwings are proportionally longer than in any *aristeus*-form; the hindwings are therefore more produced in the anal region; in the scaling of the upperside of the forewings *nomius* comes nearest to *P. aristeus parvatus* Gray from Queensland, not to *P. aristeus hermocrates* Feld. or *antierates* Doubl., the upper scales being much shorter and broader than in the two latter insects.

I keep this *Papilio* as a separate species, as I do not yet know of any intermediate forms between it and *P. aristeus* Cram.; but they may at any time turn up.

The spots of the submarginal white band on the forewings are more or less rounded, but sometimes they become almost as linear as they are in *P. aristeus* Cram.

I distinguish two feebly different geographical races:—

(a): *P. nomius* Esp. from Ceylon, South India, Central Provinces, Bengal, and southern (lower) parts of Sikkim;

(b): *P. nomius swinhoei* Moore from Hainan, Tonkin, Burma, and Tenasserim.

The black bands vary slightly in breadth in both subspecies.

(a): **P. nomius** Esp., forma typ. [♂, ♀].

In a specimen from the Felder collection labelled Bengal, Stoliezka, the white colour of the wings is rather more expanded than in other individuals, and the median band of the hindwings above is interrupted in the middle.

The anal region of the black border of the hindwings above is much overpowdered with white scales. The submarginal spots to the forewings are all rounded, except the last and the last but one, which are often more elongate.

Hab. Ceylon (2 ♂); South India (3 ♂); Central Provinces (2 ♀); Bengal (4 ♂); Sikkim (2 ♀).

(b): **P. nomius swinhoei** Moore.

Papilio swinhoei Moore, *P. Z. S.* p. 697 (1878) (Hainan).

Papilio (Pathysa) nomius, Elwes & Nicéy., *Journ. As. Soc. Beng.* p. 437. n. 115 (1886) (Poussikai; very abundant).

Papilio nomius, Eimer, *Artbild. Schmett.* p. 164 (pp.). f. q (1889); Nicéy., *Journ. Bombay N. H. Soc.* p. 387. n. 87 (1890) (Chin-Lushai); Watson, *ibid.* p. 54 (1891) (Chin-Lushai);

Holland, *Tr. Amer. Ent. Soc. Lond.* XIV. p. 123. n. 80 (1887) (Hainan); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin).

The spots of the submarginal band to the forewings are less rounded than in typical *nomius* Esp.; sometimes they are nearly as linear as in *P. aristeus* Cram. The hindwings are somewhat shorter, their black border is broader, and (above) in the caudal region not or feebly overpowdered with white scales; the white spot between the upper median branches stands mostly rather widely separate from the discal white band; below, the hindwings exhibit a short black line upon the preceostal veinlet which is absent from the specimens from the western parts of the range of *nomius*.

Hab. Hainan (1 ♂); Tonkin; Burma (15 ♂); Tenasserim.

Note.—In my opinion *P. nomius* Esp. was originally a South-West Indian form of *P. aristeus* Cram., and now has spread over Bengal, Burma, Tonkin, to South-East China. In Ceylon and West India it occurs alone; in North India it comes occasionally together with *P. aristeus omlicrates* Doubl.; in Burma and Tonkin it flies together with *P. aristeus hermocrates* Feld. While the white colour of the wings is much extended in the North Indian *P. aristeus anticrates*, the bands remain almost the same in *nomius* from every locality; further, while the Burmese and Hainan *nomius* exhibit an additional black basal line on the underside of the hindwings (see above, *swinhoëi*), which the Bengalese, South-West Indian, and Ceylonese *nomius* have not got, the Burmese *hermocrates* are all devoid of this line. If *nomius* really be the same species as *aristeus*, i.e. only an aberration of the latter, it can hardly be explained how the North Indian *aristeus* has acquired a character which the North Indian *nomius* does not exhibit, and how it comes that the Burmese *aristeus* is devoid of a character which is found in all Burmese specimens of *nomius*. I believe, therefore, that *nomius* is so fixed a form that it does not mix with *aristeus*, and has accordingly to be treated as a distinct species.—K. J.

179. *Papilio paron* Godm. & Saly. [♂].

Papilio paron Godman & Salvin, *P. Z. S.* p. 654 (1879) (New Ireland); Grose Smith & Kirby, *Rhop. Exot.* II, *Pap.* p. 30. t. 31. f. 3. 4 (1893) (New Britain; New Ireland).

Differs from *P. aristeus* Cram. especially in the anterior and posterior spots of the discal series on the underside of the hindwings being ochreous instead of red.

Hab. New Ireland; New Britain.

180. *Papilio rhesus* Boisduval. [♂].

Papilio celtibericus Boisduval, *Ind. Meth.* p. 1 (1829) (*nom. nud.*).

Papilio rhesus Boisduval, *Spec. Gén. Léop.* I. p. 253. n. 77 (1836) ("Bengal" *loc. err.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 117 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 29. n. 137 (1852); Vollenhov., *Tijdschr. v. Ent.* III. p. 77. n. 60 (1860) (Celebes); Feld., *Verh. z. b. Ges. Wien* p. 302. n. 195 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 64. n. 103 (1865) (Macassar); Piep. & Snell., *Tijdschr. v. Ent.* p. 37. n. 149 (1878) (Bantimoerong; Bonthain); Oberth., *Et. d'Ent.* IV. p. 63. n. 159 (1879) ("Amboina" *loc. err.*; spec. typ.); Stauding. & Schatz, *Exot. Schmett.* p. 9 (1888); Eimer, *Arthild. Schmett.* p. 217. t. 4. f. 6 (1889); Ribbe, *Iris* II. p. 210. sub n. 10 (1890); Rothsch., *Iris* V. p. 442 (1892) (S.W. Celebes).

Female undescribed.

Forewings with six greenish white bands instead of seven, as in *P. aristeus* Cram.; Prof. Eimer (*l.c.*) lays so much stress upon this character that he separates *P. rhesus* entirely from the *aristeus*-group. The fourth and broadest white band (counted from the base of the wing) bears, however, not seldom a black spot behind the costal margin, and this black spot has in one of my examples (and in another in Mr. Ph. Crowley's collection) developed into a black line, extending from the costal margin to near the median nervure, and dividing the intra- and antecellular portion of the white band into two bands; this specimen is thus provided with seven white bands in the costal region of the forewings, and comes indeed very near certain examples of *P. aristeus hermocrates* Feld. As *P. rhesus* is also very close to *P. aristeus* Cram. in the pattern of the hindwings, and is identical in venation with that species, there is no reason to follow Prof. Eimer.

Hab. Celebes (W. Doherty; S.E. Celebes, August to September 1891) (22 ♂).

Boisduval mentioned this species in his *Index Meth.* p. 1 (1829) under the name of *P. celtibericus*, with the erroneous habitat Spain; in *Spec. Gén.* p. 253 he

described the same specimen for the first time, and gave to it the name of *P. rhesus*, and suggested that the proper habitat might be Bengal; Oberthür, *l.c.*, enumerated this type-specimen again, and gave to it the habitat Amboina.

XXXIV. MACLEAYANUS-GROUP.

The single representative of this group has a strongly hairy body, as *P. codrus* Cram. and *P. glycerion* Gray. The green markings are partly devoid of normal scaling, those on the upperside of the forewings only in the costal region.

The scent-organ within the abdominal fold is in all the "green" *Papilios* more or less strongly developed.

181. *Papilio macleayanus* Leach [σ , φ , metam.].

Papilio macleayanus Leach, *Zool. Misc.* I. p. 17. t. 5 (♀) (1814) (Australasia); Zinken, in Germar's *Magaz. Ent.* II. p. 317 (1817); Godart, *Enc. Meth.* IX. p. 47. n. 65 (1819) (New Holland); Boisd., *Spec. Gén. Léop.* I. p. 229. n. 48 (1836) (New Holland); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 107 (1846) (Australia); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 128 (1852) (Australia); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 241 (1864) (Australia); Semper, *Journ. Mus. Godeffr.* p. 45. n. 140 (1878) (Sidney); Oberth., *Et. d'Ent.* IV. p. 60. n. 147 (1879) (Australia); Olliff, *Ann. Mag. N. H.* (6). I. p. 358. t. 20. f. 2. & 2a-c (1888) (life hist.); id., *Lord Howe I.* p. 98 (1889) (Lord Howe I.); Lyall, *Viet. Nat.* VII. p. 27 (1891) (habits); Scott, *Austral. Lep.* II. p. 31. t. 20 (1892) (life hist.).

Iphiclides macleayanus, Hübner, *Samml. ex. Schmelt. Beiträge* III. p. 26. n. 251. t. 87. f. 501. 502 (σ) (1825) (New Holland).

Papilio scottianus Felder, *Verh. z. b. Ges. Wien* p. 489 (1862) (Austr. or.); id., *l.c.* p. 306. n. 240. & p. 351. n. 136 (1864); id., *Reise Novara, Lep.* I. p. 73. n. 56 (1865).

Papilio scottianus Feld. does not deserve to stand separate even as an aberration.

Hab. Australia: Queensland (8 σ , 5 φ), New South Wales (1 φ), Tasmania, Victoria; Lord Howe Island; Norfolk Island.

XXXV. CODRUS-GROUP.

Body strongly hairy; markings of the forewings above without scales, except at the inner margin of the wing. Groups XXXIV. to XXXVII. will ultimately come into one genus.

182. *Papilio codrus* Cram. [σ , φ].

Papilio Eques Trojantis codrus Cramer, *Pap. Er.* II. p. 127. t. 179. f. A. B (1779) (Amboina); Goetze, *Ent. Beytr.* III. p. 86. n. 111 (1779); Fabr., *Spec. Ins.* p. 18. n. 69 (1781); id., *Mant. Ins.* p. 9. n. 79 (1787); Jablonsky & Herbst, *Naturs. Schmelt.* III. p. 183. t. 46. f. 3. 4 (1788); Gmelin, *Syst. Nat.* I. 5. p. 2239. n. 314 (1790) (Amboina); Fabr., *Ent. Syst.* III. I. p. 31. n. 89 (1793).

Idalides codrus, Hübner, *Verz. bek. Schmelt.* p. 85. n. 881 (1816).

Papilio codrus, Godart, *Enc. Meth.* IX. p. 48. n. 68 (1819) (Amboina); Boisd., *Spec. Gén. Léop.* I. p. 228. n. 46 (1836) (Amboina); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 33 (1840) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 105 (1846); Lucas, in Chemr's *Enc. d'Hist. Nat., Pap.* t. 1. f. 2 (1851); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 126 (1852) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 75. n. 42 (1860) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 236. & p. 351. n. 134 (1864) (Amboina; Ceram); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 61. n. 106 (1865) (Amboina; Ceram; σ & φ); Butler, *Cat. Diurn. Lep. d'over. Fabric.* p. 243. n. 33 (1869); Oberth., *Et. d'Ent.* IV. p. 60. n. 148 (1879) (Amboina); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 205 note (1884); Standing. & Schatz, *Exot. Schmelt.* I. p. 10 (1884); Ribbe, *Iris* II. p. 212 (1890) (Ceram); Röber, *Tijdschr. v. Ent.* p. 276 (1891) (Ceram).

This Papuan species has developed into six subspecies, namely :—

- (a) : *P. codrus* Cram., inhabiting the Southern Moluccas ;
 (b) : *P. codrus gilolensis* Wall., inhabiting the Northern Moluccas ;
 (c) : *P. codrus celebensis* Wall., inhabiting Celebes and the Sula Islands ;
 (d) : *P. codrus medon* Feld., inhabiting New Guinea, Waigeu, and the D'Entrecasteaux Islands ;
 (e) : *P. codrus melananthus* Feld., inhabiting the Philippine Islands ;
 (f) : *P. codrus pisidice* Godm. & Salv., inhabiting the Solomon Islands.

In the greater Sunda Islands it is replaced by *P. empedocles* Fabr., and in the Bismarck Archipelago by *P. segonax* Godm. & Salv.

(a) : **P. codrus** Cram., forma typ. [σ , φ].

The median band of the forewings consists mostly of eight spots, as in Cramer's figure, but rather often a ninth spot behind the submedian vein is also more or less clearly marked; the hindwings have sometimes a small white costal spot on the underside.

Hab. Southern Moluccas: Amboina (W. Doherty, February 1892) (2 σ , 5 φ), Saparua (2 σ , 2 φ), Ceram (2 σ).

The *females*, which are devoid of the metallic gloss of the *males* in all the forms of *P. codrus*, are commoner than the *males*.

(b) : **P. codrus gilolensis** Wall. [σ , φ].

Papilio codrus local form a (*gilolensis*) Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 64. sub n. 106 (1865) (Batjan; Gilolo).

Papilio codrus var. *gilolensis* Standing, & Schatz, *Exot. Schmett.* I. p. 10. t. 6 (σ) (1884); Ribbe, *Iris* II. p. 212. sub n. 15 (1890).

Median band of the forewings yellowish green, broader than in *P. codrus* Cram., consisting of nine spots instead of eight; hindwings with a white costal spot on the underside.

Hab. Northern Moluccas: Halmahera (2 σ , 1 φ), Batjan (W. Doherty, May 1892) (4 σ , 2 φ).

(c) : **P. codrus celebensis** Wall. [σ , φ].

Papilio codrus subspecies b (*celebensis*) Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 64. sub n. 106 (1865) (Celebes; Sula Is.).

Papilio codrus var. *celebensis*, Piepers, *Tijdschr. v. Ent.* XXI. p. 39. n. 153 (1878) (Macassar); Ribbe, *Iris* II. p. 212. sub n. 15 (1890); Holland, *Proc. Bost. Soc. N. H.* XXV. p. 78. n. 136 (1890) (S. Celebes; φ noticed).

Papilio codrus, Rothschild, *Iris* V. p. 442 (1892) (S.E. Celebes).

Median band yellowish green, as in *P. codrus gilolensis* Wall., consisting of nine spots which are narrower than in that race, and, the two posterior ones excepted, than in *P. codrus*; metallic gloss of the *male* of a deeper tint; underside of the hindwings uniform in colour. Forewings narrower in the apical region, costal margin more arched than in other forms of *P. codrus* Cram.

Hab. Celebes; Sula Island (Mangola Island, 1 σ , 1 φ); Talaut Island (1 σ ; W. Doherty leg.).

The single specimen from Talaut Island, north of Celebes, is somewhat aberrant in having the posterior spots of the median band as broad as they are in *P. codrus gilolensis* Wall., and the colour of this band pale green, as it is in *P. codrus* Cram.; the wings are shaped as in *P. codrus celebensis* Wall.

(d): *P. codrus medon* Feld. [♂, ♀].

Papilio codrus, De Haan (*unc* Cramer, 1779), *Verh. Nat. Gesch. Ned. overz. bez.* p. 33 (1810) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 126 (1852) (*p.p.*); Vollenhov., *Tijdschr. v. Ent.* III. p. 75. n. 42 (1860) (*p.p.*); Kirsch, *Mitth. Mus. Dresd.* I. p. 113. n. 16 (1877) (Waweji; Kordo; scarcely different from Amboina specimens).

(?) *Papilio codrus*, Montrouzier, *Ann. Soc. Agr. Lyon* VIII. p. 102 (1856) (Woodlark I.; *eodem* subspec.?).

Papilio medon Feld., *Verh. z. b. Ges. Wien* p. 306. n. 238. & p. 351. n. 135 (1864) (*nom. nov. loc.* *P. codri* De Haani; Nov. Guinea).

Papilio codrus subsp. *c* (*papuwensis*) Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 64. sub n. 106 (1865) (Waigeu; Aru).

Papilio codrus var. *papuwensis*, Obertbür, *Et. d'Ent.* IV. p. 60. sub n. 148 (1879) (Amberbaki).

Papilio codrus var. *medon*, Ribbe, *Iris* II. p. 212. sub n. 15 (1890).

♀. *Papilio codrus* subsp. *celebensis*, Grose Smith, *Nor. Zool.* I. p. 333. n. 11 (1891) (Biak).

♂. *Papilio codrus* subsp. *gilolensis*, Grose Smith, *l.c.* n. 12 (1891) (Humboldt Bay).

Both wings shorter than in the preceding races of *P. codrus*; median band of the forewings broader than in *P. codrus gilolensis* Wall., but narrower than in *P. codrus melanthus* Feld.; its colour as in *gilolensis* Wall. or as in *codrus* Cram. Hindwings with the white costal patch mostly larger than in *gilolensis* Wall., often as long as in *P. codrus melanthus* Feld.

Hab. Waigeu (1 ♀); Aru Island (1 ♂); Biak Island (2 ♀); New Guinea (3 ♂, 2 ♀); Ferguson Island, D'Entrecasteaux Islands (2 ♂; A. S. Meek *leg.*).

(e): *P. codrus melanthus* Feld. [♂, ♀].

Papilio melanthus Felder, *Wien. Ent. Mon.* VI. p. 283 (1862) (Mindanao; Burias; Loeban); id., *Verh. z. b. Ges. Wien* p. 306. n. 239 (1864) (Luzon; Burias); id., *Reise Novara, Lep.* I. p. 72. n. 55. t. 12. f. c (♂) (1865); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 107 (1865) (Mindanao).

Papilio codrus var. *melanthus*, Oberthür, *Et. d'Ent.* IV. p. 60. sub n. 148 (1879) (Philippines).

Papilio (Idalibus) melanthus, Semper, *Philipp., Tagfalt.* p. 279. n. 408 (1892) (Cebu; Mindanao; Camiguin; distinct species: ♀ noticed).

Median band of the forewings yellowish green, very broad; the four posterior spots mostly about twice as broad as in *P. codrus gilolensis* Wall., but sometimes scarcely broader than in *P. codrus medon* Feld. (New Guinea).

Hindwings with a costal white patch, clearly marked on the underside and here extended about as far as the apex of the cell.

Dise of the hindwings often overpowdered with yellowish instead of white scales.

Hab. Philippines: Mindanao, Burias (1 ♂), Mindoro (2 ♂), Luzon (according to Felder), Cebu, Camiguin.

(f): *P. codrus pisidice* Godm. & Salv. [♂, ♀].

Papilio pisidice Godman & Salvin, *Ann. Mag. N. H.* (6). I. p. 100 (1888) (Maleita); iid., *l.c.* p. 213 (1888).

Papilio solon Godman & Salvin, *l.c.* (6). I. p. 213 (1888) (Guadaleanar); Grose Smith & Kirby, *Rhop. Exot. I. Pap.* p. 9. t. 4. f. 1. 2 (♂) (1888) (Guadaleanar).

The type-specimen of *pisidice* has the band of the forewing golden instead of green; the golden colour, if not due to bad preservation, must be explained by individual variation; in Mr. Grose Smith's collection there is an Alu specimen which has the band not quite so golden as the type, and I have a specimen of *P. codrus celebensis* Wall., which has an almost golden band. I cannot treat, therefore, the golden *pisidice* and the green *solon* as two different races, and think that it is also inopportune to keep the green *solon* as an aberration separate from *pisidice*, as the green colour is normal and the golden colour, if natural, exceptional.

The forewings are broader and their outer margin is less convex than in *P. codrus* Cram.; the median band of the forewings is complete, as in *P. codrus celebensis* Wall.; the anterior spots are larger than in that subspecies; the spots are of more uniform size than in all the other races. In one of my *females* the spot between the lower median and the submedian veins is broadly divided into two spots, of which the anterior one is minute.

Hab. Solomon Islands: Malceta, Guadalcanar (11 ♂, 4 ♀), Alu Island (1 ♂), Bougainville Island (1 ♂).

183. *Papilio segonax* Godm. & Salv. [♂, ♀].

Papilio segonax Godman & Salvin, *P. Z. S.* p. 734 (1878) (N. Ireland).

Two local forms are known:—

(a): *P. segonax* Godm. & Salv., forma typ. [♂, ♀].

Median macular band narrow; the spots between the submedian and the upper median veins absent, so that the band consists of five spots in the apical region of the wing and one at the inner margin; very often there is a seventh, but always minute, spot between the upper and middle median nervules, and sometimes there stands also a minute spot before the submedian nervure; in this latter case only the lower median cellule is really devoid of a green mark.

Hab. Bismarck Archipelago: New Ireland (5 ♂, 1 ♀), New Britain (6 ♂).

I must enumerate this *Papilio* as a distinct species for the same reason which induced me to consider *P. islander* Godm. & Salv. distinct (see p. 439).

(b): *P. segonax tenebrionis* subsp. nov. [♀].

Of a darker black colour than the *female* of *P. segonax* and any race of *P. codrus* Cram. Wings shaped as in *P. codrus solon* Godm. & Salv., tails longer. Median band consisting of six spots, situated in the cellules from the middle median nervule to the apex; the anterior and the posterior spot small, the others even larger than in *P. codrus melanthus* Feld., the fifth extending from the cell half-way to the outer margin of the wing; spot at inner margin of wing wanting. Underside of the forewings with two cellular bands, one in the middle, and another at the apex of the cell, as pale as in *P. codrus solon* Godm. & Salv.

Hab. New Georgia, Solomon Islands (1 ♀; Captain Webster, 1894).

184. *Papilio empedocles* Fabr. [♂, ♀].

Papilio Eques Achivus empedocles Fabricius, *Mant. Ins.* II. p. 10. n. 94 (1787) (Ind. or.; Mus. Banks); id., *Ent. Syst.* III. 1. p. 70. n. 217 (1793).

Papilio empedocles, Donovan, *Ins. of Iulia* t. 20. f. 1 (1800); Godart, *Enc. Meth.* IX. Suppl. p. 810. n. 68 (1823); Boisd., *Spec. Gén. Lep.* I. p. 229. n. 47 (1836) ("Buru" *err. loc.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 106 (1846) (Ind. Arch.); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 127 (1852) (Ind. Arch.); Vollenhov., *Tijdschr. v. Ent.* III. p. 76. n. 43 (1860) (Java); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 237 (1864) (Java; "Buru?" *loc. err.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 108 (1865) (Borneo); Butler, *Cat. Diurn. Lep. descr. Fabric.* p. 243. n. 34 (1869) (type still in the Banksian coll.); Druce, *P. Z. S.* p. 358. n. 26 (1873) ("E. India"); Stauding. & Schatz, *Exot. Schmett.* I. p. 10 (1884); Stauding., *Iris* II. p. 17 (1889) (Palawan; Borneo; Malacca); Hagen, *Berl. Ent. Zeit.* p. 155. n. 182 (1892) (Banka I.); id., *Iris* VII. p. 28. n. 40 (1894) (Sumatra).

Papilio empedocles = ♀ *codrus*, De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 33 (1840) (Java).

Papilio codrus var. *empedocles*, Ribbe, *Iris* II. p. 212. sub n. 15 (1890) (Java; Borneo).

This is a fairly constant species; my Javan specimens are the smallest, and have the spots of the forewings not so large as they are in the specimens from Borneo and

Palawan. The first minute spot between the fourth and fifth subcostal branches is often absent.

From *P. codrus* Cram. it differs in the spots of the forewings being devoid of scales above and below; in *P. codrus* the spots are scaled on the underside.

Hab. Java (3 ♂); Banka Island; Sumatra; Malacca (according to Staudinger); Borneo (13 ♂, 1 ♀); Palawan (2 ♂, 1 ♀).

185. ***Papilio mendana*** Godm. & Salv. [♂, ♀].

Papilio mendana Godman & Salvin, *Ann. Mag. N. H.* (6). I. p. 212 (1888) (Guadalecanar I.); Grose-Smith & Kirby, *Rhop. Erot. I. Pap.* p. 9. t. 4. f. 3. & 4 (♀) (1888) (Guadalecanar I.).

Differs from *P. codrus* Cram., with which it agrees in the form and structure of the head, thorax, and wings, nearly in the same way as *P. isander* Godm. & Salv. does from *P. sarpedon* L. It inhabits apparently all the islands of the Solomon group, and must for the present be divided into two local forms:—

(a): ***P. mendana*** Godm. & Salv., forma typ. [♂, ♀].

I have examined, besides some examples from Guadalecanar, three specimens from Bougainville Island obtained by Carl Ribbe. The Bougainville examples differ slightly from certain Guadalecanar specimens, and, when in future a larger series of individuals can be compared, may turn out to belong to another subspecies; for the present I cannot separate them; their hindwings are shorter, and the submarginal spots of the latter are more distinctly marked, and below there is a conspicuous green spot between the praecostal and costal veins which in typical *mendana* is scarcely indicated.

Hab. Solomon Islands: Guadalecanar (2 ♀), Bougainville (1 ♂; in coll. Ribbe: 1 ♂, 1 ♀).

(b): ***P. mendana neyra*** subsp. nov. [♂, ♀].

Differs from *P. mendana* in the shorter hindwings, of which the white spots are more reduced, and in the smaller and partly obliterated spots on the forewings.

♂. *Forewings*, above, with the mark at the inner margin a third shorter than in *mendana*; the two spots between the submedian and lower median veins very small, the anterior one scarcely visible, the posterior one subcircular, of a length of about 2 mm.; the spot between the third and second median veins almost point-like; the following one a little larger, sublinear; the two next still a little larger, but hardly reaching a length of 3 mm.; the spot before the upper discoidal and that behind the third subcostal veins are merged together with the small spots which stand in the same cellules not far from the apex of the discoidal cell. On the underside, the discal markings between the second median and the submedian veins are obliterated; the preceding three spots are about equal in size, a little longer than broad, and reach a length of about 3 mm.; the following spots as above.

Hindwings, above, with two white markings before the subcostal nerve, a very small white spot in the angle formed by the subcostal and upper discoidal veins, a green elongate mark in the cell; another mark, a little longer, but narrower, between the lower median veins, and a very small linear spot between the upper median nervules; four minute submarginal whitish spots are feebly marked. Below, without a red subdiscal mark between the lower median veins, and with a complete series of white submarginal spots.

♀. Differs from that sex of *mendana* as the *male* does. The spots of the median band of the forewings are larger than in the *male*; below, those between the submedian and second median veins are feebly marked, not altogether absent. On the hindwings, above, the subbasal black band running from the costal margin across the cell along the lower median nervule is less densely covered with white scales beyond the cell than in *mendana*; the cellular white mark is narrower; the exterior one of the postcostal spots, and the spots between the subcostal and upper discoidal veins, and between the first and second median branches respectively, are much smaller. There are two minute white submarginal spots between the costal and upper discoidal veins. Below, the hindwings have five white submarginal spots, and, besides the two red spots before the cell and at the anal angle respectively, some red scales in the cell near the origin of the subcostal nervule, and some in the lower median cellule.

Hab. Solomon Islands: Rubiana (New Georgia) (1 ♂, 1 ♀ in coll. of Mr. H. Grose-Smith).

Named after Alveiro Mendana de Neyra, discoverer of the Solomon Islands.

XXXVI. EURYPYLUS-GROUP.

Abdominal region of hindwings less hairy than in the preceding group. Markings of the upperside without scales, except at the anterior margin of the hindwings; markings of the underside with two layers of glossy scales.

186. *Papilio eurypylus* L. [♂, ♀, metam.].

Papilio Eques Achivus eurypylus Linné, *Syst. Nat.* ed. x. p. 464. n. 37 (1758) (in Indiis); Clerck, *Icon. Ins.* II. t. 28. f. 2 (1764) (*fig. typ.*); Linné, *Mus. Lud. Utr.* p. 216. n. 35 (1764); Houtt., *Naturl. Hist.* 1. 11. p. 218. n. 37 (1767) (*p.p.*); Müll., *Naturs.* V. 1. p. 580. n. 49 (1774); Cramer, *Pap. Ec.* II. p. 38. t. 122. f. v. c (1777) (Amboina); Goeze, *Ent. Beytr.* III. 1. p. 70. n. 49 (1779) (*p.p.*); Fabr., *Spec. Ins.* II. p. 26. n. 106 (1781); id., *Mus. Ins.* II. p. 13. n. 124 (1787); Jablonsky & Herbst, *Naturs. Schmetz.* III. p. 116. n. 87. t. 37. f. 5. 6 (1788); Esper, *Aust. Schmetz.* t. 33. f. 1 (1792); Fabr., *Ent. Syst.* III. 1. p. 20. n. 61 (1793).

Papilio Eques Trojannus eurypylus, Charpent., in Esper's *Aust. Schmetz.* ed. ii. p. 129. t. 33. f. 1 (1830).

Papilio eurypylus, Esper, *Aust. Schmetz.* p. 39 (1785).

Zetides eurypylus, Hubner, *Verz. bek. Schw.* p. 86. n. 884 (1816).

Papilio eurypylus, Godart, *Enc. Méth.* IX. p. 45. n. 61 (1819) (*p.p.*); Boisd., *Spec. Gén. Lép.* 1. p. 233. n. 54 (1836) (*p.p.*); De Haan, *Verh. Nat. Ges. Ned. overz. bez.* p. 33 (1840); Felder, *Verh. z. b. Ges. Wien* p. 305. n. 227 (1864) (*p.p.*); Koch, *Indo-Austr. Lep. Fauna* p. 61 (1865) (*p.p.*); Wall., *Tr. Linn. S. Lond.* XXV. p. 66. n. 114 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 59. n. 142 (1879) (Amboina); id., *Ann. Mus. Civ. Genova* p. 478. n. 26 (1880) (Halmahera); Anriv., *Konigl. Sr. Vet. Akad. Handl.* XIX. 5. p. 36. n. 35 (1882); Pagenst., *Jahrb. Nass. Ver. Nat.* p. 204 (1884) (*p.p.*); Stauding & Schatz, *Exot. Schw.* 1. p. 9 (1884); Ribbe, *Leis.* II. p. 210. n. 12 (1890) (Ceram); Rober, *Tijdschr. v. Ent.* p. 275 (1891) (Ceram).

Papilio eurypylus ab. *crocospilus* Röber, *Tijdschr. v. Ent.* XXXIV. p. 275 (1891) (Ceram: *grassy or otherwise discoloured specimen!*).

Though Linné's description applies to all the various local forms into which the present *Papilio* has developed, there can be no doubt that Prof. Aurivillius (*l.c.*) is right in restricting the name of *eurypylus* to the Moluccan race. Linné described in 1758 the species from a specimen contained in the *Mus. Lud. Utr.*; Clerck figured in 1764 from the same museum a specimen which belonged certainly to the Moluccan race according to the figure, and Linné again refers to this figure in 1764 (*Mus. Lud. Utr.* p. 216).

I divide *P. eurypylus* L. into the following twelve subspecies:—

- (a): *P. eurypylus* L. from the Moluccas ;
 (b): *P. eurypylus extensus* m. from the Bismarek Archipelago ;
 (c): *P. eurypylus lycaonides* m. from New Guinea, D'Entrecasteaux Islands, Woodlark Island (?), Arn Islands (?);
 (d): *P. eurypylus lycaon* Westw. from Australia ;
 (e): *P. eurypylus sallustius* Stauding. from Wetter, Sambawa, Sumba (?);
 (f): *P. eurypylus eurypylides* Stauding. from Sambawa, Sumba (?);
 (g): *P. eurypylus jason* Esper from Ceylon, South India ;
 (h): *P. eurypylus arion* Feld. from Continental India, Malacca, Andaman Islands, Sumatra, Banka, Nias, Java, Natuna Islands, Borneo, Palawan, China ;
 (i): *P. eurypylus gordion* Feld. from the Philippine Islands ;
 (k): *P. eurypylus mikado* Leech from South Japan ;
 (l): *P. eurypylus sangirus* Oberth. from Sangir Island ;
 (m): *P. eurypylus pamphylus* Feld. from Celebes, Sula Islands.
 On the Solomon Islands no form of *eurypylus* has as yet turned up.

(a) : **P. eurypylus** L., forma typ. [♂, ♀].

The specimens from the Northern Moluccas are not subspecifically different from those from the Southern Moluccas. Linné's type came most probably from the old Dutch colony of Amboina. The abdomen is in fresh individuals of this typical subspecies of *P. eurypylus* L. white above in both sexes. The submarginal spots to the forewings are small ; the two markings standing between the fourth and fifth subcostal branches on the underside of the forewings are never merged together.

Hab. Amboina (2 ♂) ; Ceram (2 ♂, 2 ♀) ; Buru ; Batjan (W. Doherty, March 1892) (1 ♂) ; Ternate (1 ♂) ; Halmahera (2 ♂).

(b) : **P. eurypylus extensus** subsp. nov. [♂, ♀].

Papilio eurypylus, Godm. & Salv. (*nee* Linné, 1758), *P. Z. S.* p. 159, n. 40 (1879) (N. Ireland).

♂ ♀. Of the size of large specimens of *P. eurypylus* L. typ. It differs from *P. eurypylus* in the longer hindwings, in the band on the upperside of the hindwings being much longer, extending as far down as to end on a level with the anal marginal white spot, and in the longitudinal blackish band beyond the lower median nervule being paler ; as the base of the hindwings above is overpowdered with white and the blackish subbasal streak, which separates on the underside the subbasal white line from the discal band, is densely sealed with white, the discal greenish white band appears to be extended almost to the base of the hindwings on the upperside. The band on the forewings is about half as broad again at the hindmargin of the wing as between the lower median nervules.

Hab. New Ireland (type) and New Britain (in coll. H. Grose Smith : 2 ♂, 1 ♀).

(c) : **P. eurypylus lycaonides** subsp. nov. [♂].

Papilio eurypylus, Boisduval, *Spec. Gén. Léop.* 1. p. 233, n. 54 (1836) (*p.p.*).

Papilio eurypylus var. *lycaon*, Kirsch, *Mith. Mus. Dresden* 1. p. 113, n. 12 (1887) (Koro, New Guinea).

Papilio pamphylus, Grose Smith, *Nov. Zool.* 1. p. 333, n. 11 (1894) (Humboldt Bay, New Guinea).

(?) *Papilio eurypylus* var., Ribbe, *Iris* p. 78, n. 11 (1886) (Aru Is.).

Agrees with *P. eurypylus lycaon* Westw. in the median band of the wings being much broader than in the other races of *P. eurypylus* ; the submarginal spots

are, however, as small as in *P. eurypyglus* on both sides; the cellular spots of the forewings, except the two uppermost, are reduced, the two median ones on the underside mere dots in the Humboldt Bay examples.

The scaling of the median band of the upperside of the wings is in this and the two preceding races almost the same: on the forewings that band is devoid of scales except at the nervules; on the hindwings the antecellular portion has the normal two layers of scales, which are white; the intracellular part is much less densely scaled save at the subcostal vein; and the postcellular portion is devoid of scales save at the median veins. In the following race (*P. lycaon* Feld.) the posterior portion of the band of the forewings, at least from the lower median nervule to the hind margin, bears more or less dispersed white scales besides the usual short hairs; on the hindwings the cellular portion of the band is almost as densely scaled as the antecellular part, and the postcellular mark is also more or less overpowdered with white scales.

Hab. Dutch New Guinea: Humboldt Bay (W. Doherty *leg.*) (4 ♂), Ati-Ati-Onin (1 ♂), coast near Arfak (3 ♂); Waigeu (3 ♂); Aru Islands (?); Fergusson Island, d'Entrecasteaux Islands (A. S. Meek *leg.*; 1 ♂).

(d): *P. eurypyglus lycaon* Feld. [♂, ♀, metam.].

Papilio lycaon Westwood, *Arc. Ent.* II. p. 15 (1843) (Australia; *nom. nud.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 112 (1846) (Australia; *nom. nud.*); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 228 (1864) (Australia; *nom. nud.*); id., *Reis. Nor., Lep.* I. p. 68. n. 52 (1865) (*first descript.*!); Koch, *Inl.-Austr. Lep. Faun.* p. 41 (1865); Oberth., *Et. d'Ent.* IV. p. 59. n. 138 (1879); Mathew, *Tr. E. Soc. Lond.* p. 177 (1888) (*life hist.*); Scott, *Austr. Lep.* II p. 22 (1891) (*life hist.*).

Papilio eurypyglus var. *lycaon*, Gray, *Cat. Lep. Ins. B. M.* I. p. 28. sub n. 133 (1852) (Australia; *nom. nud.*); Semper, *Journ. Mus. Godeffroy* p. 44. n. 138 (1878).

Papilio eurypyglus, Scott, *Austr. Lep.* II. t. 17 (*l., p., ♂*) (1891).

The submarginal spots are much larger on the underside of the wings than on the upperside, and in this respect the Australian race comes near to many examples of the Indian form. The median band, which is whiter than in the other races owing to the difference in the scaling referred to under (c), varies somewhat in breadth; sometimes the whole discoidal cell of the hindwings is filled up with greenish white, and shows a small black spot near the apex within the white.

Hab. Australia: Queensland (10 ♂, 6 ♀), New South Wales (1 ♂, 2 ♀).

(e): *P. eurypyglus sallastius* Stauding. [♂].

♂. *Papilio sallastius* Staudinger, *Iris* VII. p. 351 (1895) (Wetter: Sambawa).

Of the size of *P. evemon* Boisid. Forewings narrower than in *P. eurypyglus lycaon* Feld.; upperside, submarginal spots as large as in that race; basal cellular spots larger, the fourth (the second from the apex) of even breadth; discal macular band as narrow as in *P. eurypyglus jason* Esp., all the nervules traversing it black; the lowest spot of this band on the forewings shorter than that between the lower median nervules. On the underside the submarginal spots are not quite so large as in *P. eurypyglus lycaon* Westw.

Hindwings, upperside, with the submarginal marks as large as in *lycaon*, the two additional linear spots inside the second submarginal spot longer than in the other races; median band narrow, sometimes separated into three spots, its scaling nearly as in *P. eurypyglus*, but not so dense within the cell. Below, the submarginal spots are longer than in *lycaon*, but not quite so broad; the red spot near the anal

angle is extended along the abdominal margin as usual; two feeble linear spots between the median nervules are inwardly bordered with white; apex of the cell with a white spot, not a red one; subbasal white streak joined to the median band or interrupted at the subcostal nervure. Underside of the abdominal fold black, with white hairs. Abdomen black above.

Hab. Wetter (W. Doherty) (2 ♂♂); Sambawa (1 ♂).

(f) : ***P. eurypylus eurypylides*** Stauding [♂].

Papilio eurypylus, Doherty (*nec* Linné, 1758), *Journ. As. Soc. Beng.* p. 193. n. 113 (1891) (Sumba; Sambawa: *p.p.*?).

♂. *Papilio jason* L. var. *eurypylides* Staudinger, *Iris* VII. p. 350 (1895) (Sambawa).

Form of the wings and of their median band as in the preceding race; but the submarginal spots smaller above and below; the uppermost but one intracellular spot on the forewings narrower towards the costal margin. Besides the red mark near the abdominal angle and that behind the costal margin there are three conspicuous red spots on the underside of the hindwings, the anterior of which stands within the discoidal cell, and the lowest of which is sometimes divided into two. Abdominal fold black, abdomen black above. Underside of the wings much darker than in the preceding subspecies. Scaling of the median band as in the Indian race (see *P. eurypylus axion* Feld).

Hab. Sambawa (W. Doherty: Sept. 1891), (8 ♂♂); Sumba (the same?).

This race comes nearest to the Ceylonese form, but has the hinder wings much shorter; on the underside of these wings the submarginal spots are smaller, the postcellular part of the median band is shorter; the discal spot between the lower median nervules on the forewings is longer than that at the inner margin, while in *P. eurypylus jason* Esp. these spots are equal in length or the posterior one is longer.

In my opinion *P. eurypylus eurypylides* Stauding is restricted to the islands between Java and Sumba, Sambawa; whereas *P. eurypylus sallastius* Standing flies on the islands farther east; in Sambawa both forms come together.

(g) : ***P. eurypylus jason*** Esp. [♂, ♀, metam.].

(?) *Papilio Barbarus Rurialis jason* Linné, *Syst. Nat.* ed. x. p. 485. n. 171 (1758) ("in Indiis").

(?) *Papilio Eques Achirus jason* id., *Mus. Lud. Utr.* p. 210. n. 29 (1864); id., *Syst. Nat.* ed. xii. p. 752. n. 38 (1767).

Papilio Eques Achirus jason, Esper, *Ausl. Schmett.* t. 58. f. 5 (1796-98).

Papilio Eques Trajanus jason, Charpent., in Esper's *Ausl. Schmett.* ed. ii. p. 237. t. 58. f. 5 (1830).

(?) *Papilio jason*, Boisduval, *Spec. Gén. Léop.* I. p. 232. n. 53 (1836); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 223. & p. 350. n. 126 (1864).

Papilio eurypylus, Gray, *Cat. Lep. Ins. B. M.* I. p. 28. n. 133 (1852) (*p.p.*).

Papilio telephus Felder, *Verh. z. b. Ges. Wien* p. 305. n. 221 (1864) (*nom. ind.*); id., *Reise Novara Lep.* I. p. 61. n. 49 (1865) (*descr.*: Ceylon).

Papilio doson Felder, *Verh. z. b. Ges. Wien* p. 305. n. 222 (1864) (*nom. nov. loco jason* Esp.; *descr. brev.*; *patria?*); Davids. & Aitk., *Journ. Bombay N. H. Soc.* p. 364. n. 69. t. E. f. 2. 2a (*l. p.*) (1890) (Karwar; life hist.).

Zetides telephus, Moore, *Lep. Ceyl.* I. p. 144. t. 63. f. 3 (1881) (Ceylon).

Zetides doson, Moore, *ibid.* I. p. 145. t. 61. f. 3 (1881) (Ceylon).

Papilio (Zetides) doson, Nicéy., *Journ. As. S. Beng.* p. 51. n. 126 (1885) (Calicut); Hampson, *ibid.* p. 364. n. 210 (1888) (Nilgiri Hills; 1000 to 6000 feet, rather rare); Fergus., *Journ. Bombay N. H. Soc.* p. 446 (1891) (Travancore).

Hindwings longer than in the race of the mainland, the sinns of the outer margin between the upper median and lower discoidal nervules much broader than the sinus before it.

Upperside: median band narrow on both wings, the spot between the lower median nervules of the forewings about half as long again as broad (in *axion* Feld. about twice as long as broad); median nervure on the hindwings black within the band; short subbasal white streak obsolete, only shining through from the underside.

Specimens from the northern parts of Ceylon have the median band broader, and are distinguishable from small examples of the Indian race only by the form of the hindwings and by the short subbasal streak to the hindwings being obsolete above.

Papilio Barbarus jason L. is a doubtful species. The characters which Linné mentions in the description (*l.c.*) partly point directly against the present *Papilio*, or any other race of *P. eurypylus*, as well as against any of the allied green *Papilios*. Aurivillius (*l.c.*) thinks it probable that *Papilio jason* L. is the same as *Metamorpha stelenes* (L.). Doubtful as *P. jason* L. ever will remain, I prefer to treat it as a query synonym of *Papilio eurypylus jason* Esp.

Esper's *Papilio Eques Achivus jason*, which has been renamed by Felder as *P. doson*, applies best to the Ceylonese race of *P. eurypylus*. The narrow median band which is interrupted at all the veins, and the absence of the costal, subbasal, white streak from the upperside of the hinder wings, are characters which are not met with in the mainland race; the hindwings are too broad in Esper's figure, but the upper median nervule being produced into a tooth, and the broad marginal sinus in front of the tooth, point again to the Ceylonese race. On the underside the subbasal white streak is connected with the median band along the costal margin in Esper's figure; I have not seen examples which have this character, except some in which the costal margin is abraded and thus appears to be white.

The *P. telephus* Feld (= *Zetides doson*, Moore) is differentiated by Felder (*l.c.*) from *P. doson* Feld. (syn. of *P. jason* Esp.) by the longer wings and by the short subbasal streak of the hindwings not being connected with the median band along the costal margin; now the form of the wings of Esper's figure points more to the Ceylonese than to the Indian race, and the second character of Esper's figure is, in my opinion, erroneous; hence I feel myself justified to consider the narrow-banded *P. telephus* Feld. as the typical *P. jason* Esp.

Hab. Ceylon (typical form chiefly in the Eastern Province) (8 ♂); S. India.

(*h*): ***P. eurypylus axion*** Feld. [♂, ♀].

- Zetides eurypylus*, Hübner (*acc* Linné, 1758), *Somalt. Ex. Schm.* II. t. 107. f. 1. 2 (1806-24); Swinh., *Tr. Ent. Soc. Lond.* p. 314. n. 396 (1893) (Khasia Hills).
- (?) *Papilio bathycles*, Lucas (*acc* Zinken, 1831), *Lép. Ex. t.* 5. f. 2 (1835).
- Papilio eurypylus*, Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 113 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 28. n. 133 (1852) (*p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 113. n. 227 (1857); Salv. & Godm., *P. Z. S.* p. 641 (1878) (Billiton I.); Wood-Mas., *Journ. As. Soc. Beng.* p. 238. n. 70 (1880) (Andaman Is.); Wood-Mas. & Nicéy., *ibid.* p. 253. n. 98 (1881) (Andaman Is.); Elwes, *Tr. Ent. Soc. Lond.* p. 435. n. 431 (1888) (Sikkim, common in the low valleys from April to October); Watson, *Journ. Bombay N. H. Soc.* p. 53 (1891) (Chin-Lushai); Robbe, *Ann. Soc. Ent. Belg.* p. 126. n. 17 (1892) (Darjeeling); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin).
- Papilio axion* Felder, *Verh. z. b. Ges. Wien* p. 305. n. 224. & p. 350. n. 128 (1864) (*nou. nov. loco eurypylus* Hübner.); Moore, *P. Z. S.* p. 697 (1878) (Hainan).
- Papilio jason*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 66. n. 115 (1865) (Malacca; Sumatra; Borneo); Moore, *P. Z. S.* p. 757 (1865); Piepers, *Tijdschr. v. Ent.* p. 155. n. 69 (1876); Honrath, *Berl. E. Zeit.* XXVIII. p. 396 (1884); Stauding. & Schatz, *Exot. Schm.* I. p. 9 (1884) (*p.p.*); Piepers, *Tijdschr. v. Ent.* p. 347. t. 8. f. 1-3 (*l.*) (1888) (Java); Snellen, *Midden-Sumatra.* II. p. 25. n. 3 (1892) (Sumatra).

- Papilio jason* var. *evemoides* Honrath, *Berl. E. Zeit.* p. 396. t. 10. f. 2 (1884) (Malacca; S.O. Borneo).
Zetides axion, Moore, *P. Z. S.* p. 257 (1882) (N.W. Himal.).
Papilio dosou, Butler, *Ann. Mag. N. H.* (5). XVI. p. 342. n. 102 (1885) (Manipur).
Papilio telephus, Distant, *Rhop. Mal.* p. 361. n. 25. f. 109 (1885); Weymer, *Stett. Ent. Zeit.* p. 273 (1885) (Nias I.); Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 69 (1887) (Hainan); Hagen, *Berl. E. Zeit.* p. 155. n. 179 (1892) (Banka I.); id., *Iris* VII. p. 28. n. 38 (1894) (Sumatra).
Papilio (Zetides) axion?, Doherty, *Journ. As. Soc. Beng.* p. 136. n. 225 (1886) (Kumaon).
Papilio (Zetides) eurypyplus, Wood-Mason & Nicé., *ibid.* p. 375. n. 184 (1886) (Cachar); Nicé., *Gazetteer of Sikkim* p. 174. n. 499 (1894) (Sikkim; very common in the low valleys from April to October).
Papilio (Zetides) telephus, Elwes & Nicé., *ibid.* p. 437. n. 141 (1886) (Ponsekai).
Papilio jason L. var. *telephus*, Standinger, *Iris* II. p. 16 (1889) (Palawan).

Submarginal spots to both wings larger than in *P. eurypyplus* L., often very much increased on the under surface. Cellular and postcellular portions of the median band of the hindwings devoid of scales except immediately behind the subcostal and upon the median nervures. Abdomen black above in both sexes, often greyish in the *male*.

(*a*²): ab. *acheron* Moore.

- Papilio acheron* Moore, *Ann. Mag. N. H.* (5). XVI. p. 120 (1885) (N.E. Bengal); Butler, *ibid.* (5). XVI. p. 342. n. 104 (1885) (Manipur).

Median band of the wings broad, submarginal spots on the underside large, two spots between the fourth and fifth subcostal nervules merged together.

(*b*²): ab. *mecisteus* Distant.

- Papilio mecisteus* Distant, *Rhop. Mal.* p. 361. n. 24. f. 108 (1885); Staud., *Iris* II. p. 16 (1889) (Palawan; ab. of *telephus*); Watson, *Journ. Bomb. N. H. Soc.* p. 54 (1891) (Chin-Lushai); Hagen, *Berl. Ent. Zeit.* p. 155. n. 178 (1892) (Banka I., "häufig"); id., *Iris* VII. p. 28. n. 37 (1894) (Sumatra).

On the underside of the hindwings the short subbasal white streak is not joined to the median band at the subcostal nervure.

The forms *acheron* and *mecisteus* cannot stand as species as there are every intergraduate specimens between them and *P. eurypyplus axion*, with which they fly together in every district; of course, there occur also examples in which the characters of *acheron* and *mecisteus* are combined, and, as *acheron* is the first described aberration, it will be best to treat all the specimens with the above-mentioned *acheron*-character as ab. *acheron* independently of the length of the subbasal white band to the hindwings.

The Chinese examples have the median band usually narrower than the Indian individuals, while the band is broader in the specimens from the Andaman Islands. The submarginal spots are especially often much enlarged in the Indian specimens. The ninth submarginal spot to the upperside of the forewings is often wanting. The red markings on the underside of the hindwings assume sometimes a yellowish colour. In the specimens from the greater Sunda Islands and Palawan the band of the wings does not become so broad as in certain Indian examples.

Hab. South-East China (6 ♂, 2 ♀); India (30 ♂, 1 ♀); Burma and Shan States (11 ♂); Malacca (7 ♂); Andaman Islands (3 ♂, 1 ♀); Sumatra (5 ♂); Banka Island; Billiton Island; Nias Island; Java (2 ♂); Borneo (7 ♂); Balabae (1 ♂); Palawan (7 ♂, 1 ♀).

(i): **P. eurypylus gordion** Feld. [σ , φ].

Papilio eurypylus, Boisduval (*vec* Linné, 1758), *Spec. Gén. Léop.* I. p. 233. n. 54 (1836) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 113 (1846) (*p.p.*); Reak., *Proc. Ent. Soc. Phil.* p. 481. n. 23 (1864) (*p.p.*).

Papilio gordion Felder, *Verh. z. b. Ges. Wien* p. 305. n. 225 (1864) (Luzon; *nom. nud.*); id., *Reise Novara, Lep.* I. p. 66. n. 50 (1865) (Luzon); Butler, *Ann. Mag. N. H.* (5). XI. p. 422. n. 77 (1883) (Mindanao).

Papilio jason, Oberthür, *Et. d'Ent.* IV. p. 59. n. 140 (1879) (Manila).

Papilio (Zetides) jason var. *gordion*, Semper, *Philipp., Tagfall.* p. 282. n. 411 (1892) (Philippines; *p.p.*).

Differs from *P. eurypylus axion* Feld. chiefly in the broader median band to the hindwings being whiter; this colour is owing to the cellular portion of the band being sealed, and the postcellular portion being also more or less overpowdered with white scales. Abdomen of the *male* often grey above.

Hab. Philippine Islands (on all the islands) (δ σ , 1 φ).

The specimens often correspond in their characters with the aberrations of *axion* ab. *acheron* Moore and ab. *mecisteus* Dist.

(k): **P. eurypylus mikado** Leech [σ , φ].

φ . *Papilio mikado* Leech, *P. Z. S.* p. 406. t. 35. f. 1 (φ) (1887) (Satsuma, Japan); id., *Butt. from China*, etc. p. 526. t. 32. f. 6 (1893).

Comes nearest to *P. eurypylus axion* ab. *acheron* Moore in the size of the submarginal markings on the underside of the wings. The red spots on the hindwings of *eurypylus* are here of a pale yellow colour. The green markings of the other races of *eurypylus* are in *mikado* almost white.

Hab. Kiu Shiu, Southern Japan (1 σ , 1 φ).

(l): **P. eurypylus sangirus** Oberth. [σ].

Papilio sangirus Oberthür, *Tr. Ent. Soc. Lond.* p. 229. t. 8. f. 1 (σ) (1879) (Sangir); id., *Et. d'Ent.* IV. p. 59. n. 143 (1879).

Papilio telephus, Westwood, *Tr. Ent. Soc. Lond.* p. 468 (1888) (Sangir I., November).

Differs from the following race in the median band on the upperside of the hindwings being separated into three spots, in the red spots on the underside of the hindwings of that race being replaced by yellow ones, and in the abdomen being black above.

Hab. Sangir Island, North of Celebes.

(m): **P. eurypylus pamphylus** Feld. [σ , φ].

Papilio pamphylus Felder, *Verh. z. b. Ges. Wien* p. 305. n. 226 (1864) (Celebes; *nom. nud.*); id., *Reise Novara, Lep.* I. p. 67. n. 51 (1865) (Celebes); Hopff., *St. E. Zeit.* p. 18. n. 7 (1871) (Celebes); Stauding. & Schatz, *Exot. Schm.* p. 9 (1884); Ribbe, *Iris* II. p. 210. sub n. 12 (1890).

Papilio telephus Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 67. n. 116. t. 7. f. 4 (1865) (Celebes); Holland, *Pr. Bost. N. H. Soc.* XXV. p. 78. n. 135 (1890) (S. Celebes); Rothschild, *Iris* V. p. 442 (1892) (S.E. Celebes).

Papilio eurypylus var. *pamphylus*, Piepers & Snellen, *Tijdschr. v. Ent.* XXI. p. 38. n. 151 (1878) (Bantimeroeng; Mangkasar).

Forewings long, with the costal margin strongly arched in the basal half; median band narrow; cellular markings to the forewings all linear; submarginal spots of both wings small on either side; abdominal margin of the hindwings white; abdomen white above in the *male*, black in the *female*, at least in the Sula Islands *female*; Celebes *females* I have not seen.

Cellular and postcellular portion of the median band of the hindwings overpowdered with white scales.

Hab. Celebes (16 ♂); Sullia Islands (Mangola) (1 ♂, 1 ♀).

187. *Papilio meyeri* Hopff. [♂, ♀].

♂ ♀. *Papilio meyeri* Hopffer, *Stett. Ent. Zeit.* p. 19. n. 8 (1874) (Celebes); Snellen, *Tijdschr. v. Ent.* XXI. p. 38. sub n. 151 (1878) (var. of *eurypyglus* L.); Ribbe, *Iris* II. p. 210. sub n. 12 (1890) (dist. spec.).

Differs from *P. eurypyglus pamphyllus* Feld. constantly in two characters:—

The blackish-brown costal fascia within the white band on the underside of the hindwings curves outwardly, crosses the subcostal nervure at the origin of the subcostal nervule, and amalgamates with the apical brown portion of the discoidal cell. The subbasal green line on the upperside of the forewings always joins the posterior spot of the median macular band.

Intermediate specimens between *P. meyeri* and *P. eurypyglus pamphyllus* are unknown, though both Papilios fly together and are common; for the present we have therefore no right to treat *P. meyeri* as a variety of *P. eurypyglus pamphyllus* Feld.

Hab. Celebes (20 ♂).

188. *Papilio evemon* Bois. [♂, ♀].

Papilio evemon Boisduval, *Spec. Gén. Léop.* I. p. 234. n. 55 (1836) (Java; Sumatra); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 114 (1846); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 220 (1864); Butler, *Tr. Linn. Soc. Lond.* (2) *Zool.* I. p. 552. n. 3 (1877) (Mal. Pen.); Oberth., *Et. d'Ent.* IV. p. 59. n. 139 (1879); Kheil, *Rhop. Nias* p. 37. n. 142 (1884) (Nias I.); Dist., *Rhop. Mal.* p. 360. n. 23. t. 32. f. 1 (1885) (Mal. Pen.; very common); Stauding., *Iris* II. p. 16 (1889); Snellen, *Tijdschr. v. Ent.* XXXIII. p. 305. n. 78 (1890) (Billiton I.); Hagen, *Berl. Ent. Zeit.* p. 155. n. 177 (1892) (Banka I.); id., *Iris* VII. p. 28. n. 36 (1894) (Sumatra).

Papilio jason var. *evemon*, Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 67. sub n. 115 (1865); Honrath, *Berl. Ent. Zeit.* p. 396 (1884); Standing. & Schatz, *Exot. Schmett.* I. p. 9. t. 6 (♂) (1884).

Papilio eurypyglus var. *evemon* De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 33 (1840); Gray, *Cat. Lep. Ins. B. M.* I. p. 28. sub n. 133 (1852) (Borneo); Vollenhov., *Tijdschr. v. Ent.* III. p. 76. sub n. 47 (1860) (Borneo; Padang).

(?) *Papilio (Zetides) jason* var. *gordion*, Semper, *Philipp., Tagfalt.* p. 282. n. 411 (1892) (Philipp.; p.p.).

(?) *Papilio jason*, Snellen, *Midden-Sumatra* II. p. 25. n. 3 (1892) (Sumatra).

Distinguished from *P. eurypyglus axion* Feld., of which it has been often considered to be a mere aberration, by the black costal streak on the underside of the hindwings within the white median band being always united at the subcostal nervure to the black band which runs along the abdominal margin, and being devoid of the costal red spot; further, by the scent-organ within the abdominal fold of the male being reduced to a small streak, which is only visible when the fold is wholly opened out. On the upperside of the forewings the spot near the apex of the cell in front of the lower discoidal nervule is very seldom present: out of over eighty specimens I find it in one specimen only, and there it is minute.

Hab. Malacca (48 ♂); Sumatra (10 ♂); Java; Nias; Borneo (25 ♂).

189. *Papilio procles* Grose Smith [♂].

Papilio procles Grose Smith, *Ann. Mag. N. H.* (5). XX. p. 433 (♂) (1887) (Kina Balu); id. & Kirby, *Rhop. Ex.* I. *Pap.* p. 13. t. 6. f. 1. 2 (♂) (1888).

Cell to forewings with four markings only, the uppermost spot of the allied species being absent. Short brown costal streak within the median white band on

the underside of the hindwings narrow, of the same position as in *P. eurypylus axion* Feld., mostly reaching the subcostal vein, but often abbreviated halfway between costal and subcostal nervures; with or without an orange spot at costal nervure; underside of hindwings with orange (not red) discal spots the uppermost of which is placed outside the apex of the cell between the two first discoidal nervures.

Male without woolly scent-organ within the abdominal fold of the hindwings.

Hab. North Borneo: Mount Kina Balu (12 ♂).

190. *Papilio leechi* sp. nov. [♂].

Papilio bathycles, Leech (*nee* Zinken, 1831), *Butt. from China*, etc. p. 525 (1893) (Chang-Yang, China).

Upperside: Discal band of forewings broad; the veins traversing it broadly black and the maculae composing the band, therefore, very elongate. Hindwings similar to *P. bathycles chiron* Wall., but the veins within the median band are broadly black, and the blackish line running from the costal margin to the end of the cell in *P. bathycles* and *chiron* is almost invisible anteriorly.

Underside: The before-mentioned black line of the hindwings is very thin anteriorly and bears a yellow spot; along the abdominal margin runs a white streak as in *chiron*; discal yellow markings large.

Within the abdominal fold is a yellowish, fulvous, woolly patch as large as in *P. eurypylus* L.

Hab. Chang-yang, China (*type* in coll. J. H. Leech).

The well-developed woolly scent-organ in the abdominal fold, which is entirely absent from *P. bathycles* and *chiron*, is a very remarkable character in the present species, the more so as in *Papilio exemon* this organ is reduced to a narrow streak situated immediately at the abdominal margin proper, and thus shows that the presence or absence of this sexual character cannot be used for distinguishing genera in the family of *Papilionidae*.

191. *Papilio bathycles* Zink. [♂, ♀].

Papilio bathycles Zinken, *Nor. Act. Ac. Nat. Cur.* p. 157. t. 14. f. 6. 7 (♂) (1831) (Java); Guér., in Bélanger, *Voy. Ind. Or., Zool.* p. 505. t. 5. f. 1. 1 A (1834); Boisdu, *Spec. Gén. Lép.* I. p. 232. n. 52 (1836) (Java); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 111 (1846) (*p.p.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 28. n. 132 (1852) (*p.p.*); Vollenh., *Tijdschr. v. Ent.* II. p. 76. n. 46 (1860) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 229 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 66. n. 113 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 58. n. 137 (1879) (Java); Honr., *Berl. Ent. Zeit.* XXVIII. p. 396 (1884); Standing. & Schatz, *Exot. Schmett.* 1. p. 9 (1884).

This species, which is devoid of a cottony scent-organ within the abdominal fold of the hindwings of the *male*, has three local forms:—

(a): *P. bathycles* Zink. from Java.

(b): *P. bathycles bathycloides* Honr. from Malacca; Sumatra; Borneo; Palawan.

(c): *P. bathycles chiron* Wall. from Sikkim; Assam; Burma.

(a): **P. bathycles** Zink., forma typ. [♂].

Female unknown to me. Without green (above) or white (below) mark behind the lower median branch of the hindwings.

Hab. Java (6 ♂). Most probably also in South-West Sumatra.

(b) : *P. bathycles bathycloides* Hour. [♂, ♀].

- Papilio bathycles*, De Haan (nec Zinken, 1832), *Verh. Nat. Gesch. Ned. overz. bez.* p. 33 (1840); Gray, *Cat. Lep. Ins. B. M.* 1. p. 28. n. 132 (1852) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 229 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 66. n. 113 (1865) (*p.p.*); Druce, *P. Z. S.* p. 357. n. 23 (1873) (Borneo); Butl., *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 552. n. 5 (1877) (Mal. Pen.); Dist., *Rhop. Mal.* p. 362. n. 25. t. 32. f. 2 (♂) (1885) (Mal. Pen.); Hagen, *Iris* VII. p. 28. n. 39 (1894) (Sumatra).
- Papilio bathycles* var., Vollenhoven, *Tijdschr. v. Ent.* III. p. 76. n. 46 (1860) (Borneo).
- Papilio chiron*, Oberthür (nec Wallace, 1865), *Et. d'Ent.* IV. p. 58. n. 136 (1879) (Borneo).
- Papilio bathycles* var. *bathycloides* Honrath, *Berl. Ent. Zeit.* XXVIII. p. 396. t. 10. f. 3 (1884) (Malacca; Borneo); Stauding., *Iris* II. p. 16 (1889) (Palawan).
- Papilio (Zitides) bathycles* var. *bathycloides*, Semper, *Philipp., Tagfult.* p. 283. n. 412 (1892) (Palawan).

Orange spot near costal margin absent from the underside of the hindwings; small green discal spot between the upper median nervules on the upperside of the hindwings also wanting; no mark behind the lower median nervule of the hindwings.

In one example from Theiping (Mal. Pen.) the ochreous spots on the underside of the hindwings are all obliterated.

Hab. Malacca (7 ♂); Sumatra (1 ♂); Borneo (6 ♂); Palawan (3 ♂).

(c) : *P. bathycles chiron* Wall. [♂, ♀].

- Papilio bathycles*, Doubl. Westw. & Hew. (nec Zinken, 1832), *Gen. Diurn. Lep.* I. p. 14. n. 111 (1846) (*p.p.*; N. India); Gray, *Cat. Lep. Ins. B. M.* 1. p. 28. n. 132 (1852) (*p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 114. n. 228 (1857) (N. India; Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 229 (1864) (*p.p.*); Butl., *Ann. Mag. N. H.* (5). XVI. p. 343. n. 105 (1885); Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 198 (1890) (Shan States; very common; no ♀ found).
- Papilio chiron* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 66. note (1865) (Assam; Sylhet); Moore, *P. Z. S.* p. 757 (1865); Honrath, *Berl. E. Zeit.* XXVIII. p. 397 (1884) (Sikkim); Stauding. & Schatz, *Erot. Schmett.* 1. p. 9 (1884).
- Papilio bathycles* var. *chiron*, Elwes, *Tr. Ent. Soc. Lond.* p. 436. n. 432 (1888) (Sikkim, 2000 to 3000 feet, ♂ not uncommon).
- Zitides bathycles*, Swinhoe, *Tr. Ent. Soc. Lond.* p. 314. n. 397 (1893) (Khasia Hills).
- Papilio (Zitides) bathycles*, Nicéville, *Gazetteer of Sikkim* p. 175. n. 500 (1894) (Sikkim; rather less common than *P. eurypylus* L.).

Differs from *bathycles* and *bathycloides* in the hindwings, above, having a green, below, a white stripe behind the median nervure and lower median nervule; the length of this mark is variable; below the stripe is longer than above. In *bathycles* and *bathycloides* this stripe is seldom, and then only slightly, indicated.

(a²) : ab. *chironides* Hour.

- Papilio chiron* var. *chironides* Honrath, *Berl. E. Zeit.* XXVIII. p. 397. t. 10. f. 4 (1884) (Sikkim).

Costal ochreous spot absent from the underside of the hindwings.

Hab. Sikkim (16 ♂, 1 ♀); Assam (16 ♂); Shan States (6 ♂).

The aberration *chironides* differs in the same way from *chiron*, as *bathycloides* does from *bathycles*; while, however, *bathycloides* inhabits an area where *bathycles* does not occur, *chironides* flies together with *chiron*.

The following four species form the so-called *sarpedon*-group, which is not separable from the *eurypylus*-group.

192. *Papilio gelon* Boisdu. [♂, ♀].

Papilio gelon Boisduval, *Bull. Soc. Ent. Fr.* p. 155 (1859) (N. Caledonia); Fell, *Verh. z. b. Ges. Wien* p. 305. n. 219 (1864); Butler, *P. Z. S.* p. 290. n. 99 (1874); id., *Ann. Mag. N. H.* (4). XX. p. 355. n. 28 (1877) (Lifu I.); Oberth., *Et. d'Ent.* IV. p. 59. n. 145 (1879); Lucas, *Bull. Soc. E. Fr.* p. 50 (♀) (1883); Rothsch., *Tr. Ent. Soc. Lond.* p. 141. t. 6 (1892) (vars.).

This is so variable a species that scarcely two specimens are identical. *P. megasthenes* Math. is based on an example which has the median band of the wings very broad, and is merely one of the numerous individual aberrations of *P. gelon*.

(a²): ab. *megasthenes* Math.

♀. *Papilio megasthenes* Mathew, *Tr. Ent. Soc. Lond.* p. 314 (1889) (Noumea, New Caledonia).

Hab. Loyalty Islands (Lifu Island: 16 ♂, 12 ♀); New Caledonia.

193. *Papilio isander* Godm. & Salv. [♂, ♀].

Papilio isander, Godman & Salvin, *Ann. Mag. N. H.* (6). I. p. 211 (1888) (Aola, Guadalcanar I.); Grose Smith & Kirby, *Rhop. Exot.* I. *Pap.* p. 13. t. 6. f. 3 (1888).

Differs from all the races of *P. sarpedon* in having a series of green submarginal spots on the forewings.

A specimen in Mr. Crowley's collection has a green spot in the apex of the cell of the forewings.

Hab. Solomon Islands: Guadalcanar (5 ♂, 1 ♀), Isabel (1 ♀), Shortland Islands (1 ♂, 1 ♀), Bougainville (1 ♂).

My single specimen from Isabel Island has only three green submarginal spots to the upperside of the forewings, and two more whitish, rather feebly marked lunules. A specimen from the Shortland Islands (collected by C. Ribbe) has also only five submarginal markings, while the individuals from Guadalcanar which I have compared, and a *male* from Bougainville Island and a *female* from the Shortland Islands, have five or six green submarginal spots.

In the Bougainville and Shortland examples the anterior spots of the discal macular band are slightly smaller than in the specimens from Guadalcanar and in that from Isabel, otherwise they are not different.

If we take into consideration, firstly, that in various races of *P. sarpedon* L. the forewings are provided on the underside with a series of submarginal, more or less clearly marked, spots; secondly, that these spots often appear on the upperside, where they, however, are never devoid of scales and therefore not green; thirdly, that the additional postcostal spot as well as the uppermost green submarginal spot appear in *P. sarpedon imparilis* m. (Bismarck Archipelago), and the latter also in *P. sarpedon impar* mihi; and, fourthly, that in some specimens of *isander* the number of green submarginal spots is reduced to three; it becomes rather more than probable that *Papilio isander* is also a form of *P. sarpedon*; the only link of the chain which is still wanting is a specimen with two submarginal green spots. This link certainly will turn up one day; but as I base my work on facts, not on supposition, I must treat *P. isander* as a species, not as a subspecies.

This *Papilio* is of great importance as regards the division of the green *Papilios* into genera; it shows that *P. sarpedon* and *P. eurypylus* with its various allies cannot be separated generically, and that therefore the "genus" *Chlorisses* Swains. (syn.: *Dalchina* Moore) must sink as a synonym of *Zetides* Hübn. We learn here again that the division of the *Papilionidae* into genera must be based upon all the species of the world, and that naturally many mistakes occur, if one bases the division

on the species of a single region or subregion only, as is done by Mr. Strecker as well as by Mr. Moore.

194. *Papilio sarpedon* L. [♂, ♀, metam.].

Roesel, *Ins. Belust.* IV. p. 48. t. 6. f. 1 (1761).

Papilio Eques Trojannus sarpedon Linné, *Syst. Nat.* ed. x. p. 461. n. 14 (1758) (Asia); id., *Mus. Lud. Vr.* p. 196. n. 15 (1764) (India); id., *Syst. Nat.* ed. xii. p. 747. n. 15 (1767); Houtt., *Naturl. Hist.* I. 11. p. 198. n. 14 (1767) (p.p.); Mull., *Naturs.* V. 1. p. 570. n. 15 (1774); Fabr., *Syst. Ent.* p. 447. n. 21 (1775); Goeze, *Ent. Beytr.* III. p. 36. n. 15 (1779) (p.p.); id., *Spec. Ins.* II. p. 8. n. 28 (1781); Esper, *Aust. Schmett.* p. 38 (p.p.). t. 8. f. 2 (1785) (*fig. mal.*); Fabr., *Mont. Ins.* II. p. 4. n. 30 (1787) (p.p.); id., *Ent. Syst.* III. 1. p. 14. n. 41 (1793) (p.p.); Thunberg, *Mus. Nat. Ups.* XXIII. p. 9 (1804); Shaw, *Gen. Zool.* VI. 1. p. 208 (1806) (*P. E. Tr. demophon* on pl. 64).

Papilio Eques Trojannus demophon Meerburgh, *Afbeeld.* t. 9 (1775); Goeze, *Ent. Beytr.* III. 1. p. 69. n. 47 (1779) (p.p.).

Papilio Eques Trojannus demophon, Shaw, *Gen. Zool.* VI. 1. t. 64 (1806).

Zetides sarpedon, Hubner, *Verz. bek. Schmett.* p. 85. n. 883 (1816); id., *Summl. Ex. Schmett.* III. t. 25 (1824-41) (Java).

Papilio sarpedon, Godart, *Enc. Meth.* IX. p. 46. n. 62 (1819) (p.p.); Zinken, *Nov. Act. Ac. Nat. Cur.* XV. p. 156 (1831) (Java); Boisd., *Voy. Astrol.*, *Ent. Lép.* p. 44. n. 12 (1832) (p.p.); Lucas, *Lép. Ex. p.* 9. t. 5. f. 1 (1835); Boisd., *Spec. Gén. Lép.* I. p. 235. n. 57 (1836) (p.p.); Thon, *Naturg. Schm.* p. 19. t. 6. f. 22 (1837) (p.p.); De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 7. 34. t. 7. f. 15 (L.) (1840) (*fig. mal.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 115 (1846) (p.p.); Hutton, *Tr. Ent. Soc. Lond.* V. p. 51. n. 12 (1847) (Mussoree, May to September); Kollar, in Hügel's *Kaschnir* IV. p. 405 (1848) (Cashmere); Gray, *Cat. Lep. Ins. B. M. I.* p. 28. n. 135 (1852) ("Sandwich Is." *loc. err.*); Lucas, in Chenn's *Encl. Hist. Nat., Pnp.* t. 20. f. 1 (1853); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 113. n. 226. t. 3. f. 8. 8a (L., p.) (1857); Vollenhov., *Tijdschr. v. Ent.* III. p. 76. n. 48 (1860) (p.p.); Reak., *Pr. Ent. Soc. Phil.* p. 483. n. 24 (1864) (p.p.); Feld., *Verh. z. b. Ges. Wien* p. 304. n. 214. & p. 350. n. 122 (1861); Lang, *Ent. Mo. Mag.* p. 101 (1864) (N.W. Himal.); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 110 (1865) (p.p.); Koch, *Ind.-Austr. Lep. Fauna* p. 39 (1865) (p.p.); Moore, *P. Z. S.* p. 487 (1865) (N.W. Himal.); id., *Id.* p. 757 (1865); Orza, *Lép. Jap.* p. 10. n. 4 (1869) (Japan); Butl., *Cat. Diurn. Lep. descr. by Fabric.* p. 242. n. 30 (1869); Druce, *P. Z. S.* p. 357. n. 21 (1873) (Siam); Piepers, *Tijdschr. v. Ent.* XIX. p. 155. n. 69 (1876) (Java); Butl., *P. Z. S.* p. 814. n. 34 (1877) (Formosa); id., *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 552 n. 2 (1877) (Mal. Pen.); Salv. & Godm., *ibid.* p. 611 (1878) (Billiton I.); Moore, *ibid.* p. 841 (1878); Oberthür, *Et. d'Ent.* IV. p. 59. n. 144 (1879); Nicéev., *Journ. As. S. Beng.* p. 59. n. 113 (1881); Elwes, *P. Z. S.* p. 873 (1881) (N.E. Asia & Japan); Aurivill., *K. Svensk. Vet. Ak. Handl.* XIX. 5. p. 20. n. 15 (1882); Standring, & Schatz, *Zeit. Schm.* I. p. 9 (1884); Butl., *Ann. Mag. N. H.* (5). XVI. p. 343. n. 106 (1885) (Manipur); Dist., *Rhop. Mal.* p. 359. t. 22. f. 6 (1885) (Mal. Pen.); Weymer, *Stat. E. Zeit.* p. 273 (1885) (Nias I.); Pryer, *Rhop. Nihon.* p. 5. n. 9. t. 1. f. 9 (1881) (Japan); Leech, *P. Z. S.* p. 405. n. 9 (1887) (Japan); Dist. & Pryer, *Ann. Mag. N. H.* p. (5). XIX. p. 273 n. 178 (1887) (Sandakan); Holland, *Tr. Amur. Ent. Soc.* XIV. p. 122. n. 71 (1887) (Hainan); Elwes, *Tr. Ent. Soc. Lond.* p. 434. n. 430 (1888) (Sikkim); up to 7000 feet, from April to October); Piepers, *Tijdschr. v. Ent.* XXXI. p. 346. t. 7. f. 8. 9. (1888) (life hist.: Java); Standring, *Iris* II. p. 15 (1889) (Palawan); Manders, *Tr. Ent. Soc. Lond.* p. 536. n. 197 (1890) (Siam States: abundant; commonest at elevations of 3000 feet); Snellen, *Tijdschr. v. Ent.* XXXIII. p. 305. n. 77 (1890) (Billiton I.); Watson, *Journ. Bombay N. H. Soc.* p. 54 (1891) (Chin Lushai); Hagen, *Berl. Ent. Zeit.* p. 155. n. 176 (1892) (Banka I.); Oberthür, *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin); Hagen, *Iris* VII. p. 28. n. 34 (1894) (Sumatra; common).

Chlorisses sarpedon, Swainson, *Zool. Illustr.* (2). II. t. 89 (1832).

Papilio medon, Koch (*see* Felder, 1864), *Ind.-Austr. Lep.-Fauna* p. 40 (1865) (Java).

Papilio teredon, Butler (*see* Felder, 1865), *Ann. Mag. N. H.* (5). IX. p. 19. n. 33 (1882) (Japan).

Papilio (Dalchini) sarpedon, Doherty, *Journ. As. Soc. Beng.* p. 136. n. 224 (1886) (Kumaon); Wood-Mas. & Nicéev., *ibid.* p. 376. n. 185 (1886) (Cachar); Elwes & Nicéev., *ibid.* p. 437. n. 142 (1886) (Tavoy; Siam); Nicéev., *Journ. Bombay N. H. Soc.* p. 54. n. 14. t. L. f. 11 (♂) (1893) (Sumatra: melanoid aberration); id., *Gazetteer of Sikkim* p. 174. n. 498 (1894) (Sikkim: common throughout the warm months from 1000 to 7000 feet).

Dalchini sarpedon, Moore, *P. Z. S.* p. 257 (1882) (N.W. Himal.); id., *Journ. Linn. Soc. Lond.* XXI. p. 50 (1889) (Mergui Arch.); Swinh., *Tr. Ent. Soc. Lond.* p. 314. n. 395 (1893) (Khasia Hills).

The type of this species is still preserved in the Stockholm Museum, and agrees best, according to Aurivillius (*l.c.*), with Hübner's figures of Javan specimens. The *Papilio sarpedon* of the whole of the Indo-Malayan subregion, including the Philippine Islands and Japan, and excluding Ceylon and South India, can scarcely be split up into local forms. The *P. sarpedon* of China, however, are mostly different; unfortunately these differences are not at all constant. The Japanese spring brood is mostly the same as typical *P. sarpedon*; the specimens of the summer broods are larger, the green band of the wings is narrow and mostly interrupted at the veins, and the hindwings are produced into a tooth at the end of the upper median nervule (not quite so much as in *P. sarpedon teredon* Feld. from South India and Ceylon), and agree very well with such Chinese examples which have a complete median band to the wing that is interrupted on the forewings at the nervules. I think it not advisable to treat the Japanese *sarpedon* as a separate subspecies, as the distinguishing characters are found only in a relatively small number of individuals.

I divide the present species into the following geographical races:—

- (a): *P. sarpedon* L. from Continental India to Java, the Philippines, and Japan, exclusive of South India and Ceylon;
- (b): *P. sarpedon semifasciatus* Honr. from China;
- (c): *P. sarpedon teredon* Feld. from Ceylon and S. India;
- (d): *P. sarpedon parsedon* Westw. from the lesser Sunda Islands;
- (e): *P. sarpedon choredon* Feld. from Australia, New Guinea, Waigeu;
- (f): *P. sarpedon imparilis* m. from the Bismarck Archipelago;
- (g): *P. sarpedon impar* m. from the Solomon Islands;
- (h): *P. sarpedon withedon* Feld. from the Moluccas;
- (i): *P. sarpedon milon* Feld. from Celebes, Sula Islands, Talant Island.

(a): **P. sarpedon** L., forma typ. (♂, ♀ metam.).

The red spots on the underside of the hindwings assume sometimes an orange yellow tint.

M. de Nicéville figures (*l.c.*) a curious melanistic aberration of this species which has almost entirely lost the green band of the wings. I have a Darjeeling specimen which shows the beginning of melanism, the median band being thinly overpowdered with black scales, and part of the scales of the upper layer of the band beneath having become black. It is not the green colour of the band which is replaced by black. In *P. antiophates* ab. *nebulosus* Butl. and in *P. aristens* ab. *nigricans* Eimer the white scales have assumed a black colour; on the upperside of the wings of the melanistic *sarpedon* the scaleless band becomes scaled black. A specimen of *P. eurypylus arion* Feld. in the Hewitson Coll. (Brit. Mus.) has the markings also partly black, and exhibits the same additional scaling as the melanistic *sarpedon*.

Hab. Continental India (exc. South India) (25 ♂); Malacca (7 ♂); Sumatra (6 ♂); Nias; Engano (1 ♂); Java (2 ♂, 1 ♀); Bunguran; Natuna Islands (2 ♂, 2 ♀); Borneo (18 ♂); Palawan (3 ♂); Philippines (7 ♂); Loo Choo Islands (1 ♂, 1 ♀); South Japan (18 ♂, 3 ♀).

In China there occur specimens, together with typical *P. sarpedon* and examples which are like those of the Japanese summer brood, rather abundantly in which the median band of the hindwings is more or less obliterated; in the form of the hindwings these specimens agree mostly with the Japanese summer brood. Here we have a case that in one locality part of the specimens are quite different from the

typical form of the species, while other specimens are often indistinguishable from the latter, and one is as justified in treating the rather prevailing aberrant specimens as mere individual aberrations, which are, however, *local* in this case, as one may consider them to belong to a local race which is still very inconstant, and till produces numerous atavistic specimens. I take the last point of view, and accordingly have to enumerate the Chinese *P. sarpedon* as

(b): *P. sarpedon semifasciatus* Hour. [♂, ♀].

Papilio sarpedon var. *semifasciatus* Honrath, *Ent. Nachr.* p. 161 (1888) (China); Leech, *Tr. Ent. Soc. Lond.* p. 115, note (1889); id., *Butt. from China*, etc. p. 525 (1893).

Papilio sarpedon var., Leech, *Tr. Ent. Soc. Lond.* p. 115, n. 69, t. 7, f. 2 (1889).

Papilio sarpedon, Leech, *Butt. from China*, etc. p. 524 (1893) (*excl. synonym.*).

Median band to the hindwings often more or less obliterated. Band of the forewings mostly interrupted at the black nervules.

Hab. China (30 ♂, 7 ♀).

(c): *P. sarpedon teredon* Feld. [♂, ♀ im etam.].

Papilio sarpedon var., Gray, *Cat. Lep. Ins. B. M. I.* p. 28, sub n. 135 (1852) (Ceylon).

Papilio teredon Felder, *Verh. z. b. Ges. Wien* p. 305, n. 215 (1864) (*nomen nud.*; Canara & Ceylon); id., *Reise Novara Lep.* I. p. 61, n. 47 (1865) (Ceylon).

Dalchinea teredon, Moore, *Lep. Ceyl.* I. p. 143, t. 62, f. 1, 1a, 1b (*l., p., imag.*) (1881) (Ceylon, common: genus *Dalchinea* characterised).

Papilio (*Dalchinea*!) *teredon*, Hampson, *Journ. As. S. Beng.* p. 364, n. 208 (1888) (Nilgiris, 2000 to 7000 feet); Ferguson, *Journ. Bombay N. H. Soc.* p. 446 (1892) (Travancore).

Papilio sarpedon, Aitken & Davids., *Journ. Bombay N. H. Soc.* p. 364, n. 68 (1890) (Karwar; larvae from July till October).

Median band of the wings mostly much narrower than in *P. sarpedon*, the veins crossing the band nearly all black; hindwings with the upper median vein produced into a rather prominent tooth.

The first spot of the median band is sometimes absent, as Felder already said in the diagnosis of *teredon*; this aberration is described by Swinhoe as a distinct species; it occurs together with *teredon* in Ceylon and Southern India.

(a²): *ab. thermodusa* (Swinhoe).

Dalchinea (!) *thermodusa* Swinhoe, *P. Z. S.* p. 146, n. 145 (1885) (Matheran).

Papilio (*Dalchinea*) *thermodusa*, Hampson, *Journ. As. Soc. Beng.* p. 364, n. 209 (1888) (Nilgiri Hills; the northern slopes; two specimens in February).

Hab. Ceylon (5 ♂, 1 ♀); Southern India (15 ♂, 3 ♀).

(d): *P. sarpedon parsedon* Westw. [♂].

Papilio parsedon Westwood, *Tr. Ent. Soc. Lond.* p. 99, t. 5, f. 1, 2 (1872) (*patria?*).

Small form; band of the wings as broad as in *P. sarpedon choredon* Feld.; hindwings with longer tooth than in *P. sarpedon teredon* Feld.

Hab. Timor, Dili (W. Doherty, May 1892) (1 ♂); Wetter (id., May 1892) (1 ♂); Adonara (id., November 1891) (1 ♂).

I believe to be right in identifying the form from the lesser Sunda Islands with Westwood's species. The type-specimen (in coll. of Messrs. Godman & Salvin) was probably killed soon after the emergence from the pupa, hence the white colour of the median band; I have two bred specimens of *choredon* which exhibit the same colour.

(e): ***P. sarpedon choredon*** Feld. [σ , φ , metam.].

Papilio sarpedon, Guérin (*sec* Linné, 1758), *Œy. Astrol., Eutom.* p. 44. n. 12 (1832) (*p.p.*); Boisdu, *Spec. Gén. Lép. I.* p. 235. n. 57 (1836) (*p.p.*); Doubl. Westw. & Hew., *Gen. Diura. Lep. I.* p. 14. n. 115 (1846) (*p.p.*); Montrouze, *Essai Faune Woodlark* p. 123 (1857) (Woodlark); Koch, *Indo-Austr. Lep. Fauna* p. 39 (1865) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 110 (1865) (*p.p.*); Math., *Proc. Linn. Soc. N. S. Wales* p. 264 (1885); Scott, *Aust. Lep.* II. 1. p. 21. t. 17 (φ & larva) (1890) (life hist.).

Papilio sarpedon var., Gray, *Cat. Lep. Ins. B. M. I.* p. 28. n. 135. t. 4. f. 1 (1852) (Austral.).

Papilio choredon Felder, *Verh. z. b. Ges. Wien* p. 305. n. 218. & p. 350. n. 123 (1864) (Australia); New Guinea; Waigeu; Woodlark); Butl., *Ann. Mag. N. H.* (4). XVIII. p. 125. n. 126 (1876) (N. Guinea; Cape York); id., *P. Z. S.* p. 471 (1877) (Cape York); Oberth., *Ann. Mus. Civ. Gen.* XV. p. 478. n. 25 (1880) (Waigeu; Somerset, Cape York).

Papilio sarpedon var. *choredon*. Semper, *Journ. Mus. Godeffr.* p. 44 (Separ.) (1874); Ribbe, *Iris* p. 78. n. 10 (1886) (Aru I.); Olliff, *Ann. Mag. N. H.* (6). I. p. 357. t. 20. f. 1 (l.) (1888) (life hist.).

Very close to typical *P. sarpedon*, but the forewings broader, the median nervules and the submedian nervure being longer; median band always broad, on the hindwings usually shorter than in *P. sarpedon*; mostly the median nervules of the forewings white within the band; black line inside the red costal mark on the underside of the hinder wings narrower than in *P. sarpedon*.

Hab. Queensland (44 σ , 11 φ); New South Wales (3 σ , 2 φ); New Guinea (11 σ , 2 φ); Aru Islands; Waigeu Island (3 σ); and (?) Woodlark Island.

(f): ***P. sarpedon imparilis*** subsp. nov. [σ].

Papilio choredon, Godman & Salvin, *P. Z. S.* p. 148. n. 35 (1877) (Duke of York I.); iid., *l.c.* p. 159. n. 41 (1879) (N. Ireland).

σ . Upperside as deep black as in *P. sarpedon milon* Feld., *i.e.*, much darker than in *choredon* Feld. Underside darker than in any race of *sarpedon*; the interspaces between the di-cast red markings and the submarginal lunules of the hindwings are entirely filled up with black; the black spots at the basal side of the red markings are of a deep tint.

The median band of the wings is scarcely narrower than in *P. sarpedon choredon* Feld.; on the forewings there is mostly an additional green or white minute spot marked above or below, or on either side; this spot has in some specimens the same position as in *P. sarpedon impar* mihi, or it stands behind the first mark of the macular band occupying the same place as the first spot of the submarginal series in *P. isander* Godm. & Salv., or it stands in the apex of the cell rather close to the lower discocellular veinlet.

φ . Unknown.

Hab. New Britain (7 σ); New Ireland; Duke of York.

This form is remarkable not only for the deep black colour of the upperside, but especially for the appearance of the additional spot in variable position, in consequence of which it naturally leads over from *P. sarpedon choredon* to *P. sarpedon impar*, and also to a certain degree to *P. isander*. The additional spot is, however, not an altogether new character, but is found indicated by some whitish scales in a few specimens of other subspecies of *sarpedon*.

(g): ***P. sarpedon impar*** subsp. nov. [φ].

φ . Wings shaped as in *P. isander* G. & S., ground colour of the wings darker than in typical *P. sarpedon choredon* Feld.

Upperside: Forewings with the median band broader behind than in *P. isander*;

with an additional spot behind the costal margin varying in size, but always much larger than the first (postcostal) spot of the median band; hindwings with the spot between subcostal and the upper discocellular veins larger than in *isander*; the outer border of the median band less straight; submarginal spots rather larger.

Underside: Forewings with the whitish submarginal lunules between the upper median nerve and the hindangle of the wing rather large and well defined; sometimes there is a complete series of submarginal lunules, of which, however, the anterior ones are indistinct; these lunules are sometimes also feebly marked on the upperside. Hindwings with the red markings rather larger than in *isander*.

Hab. Solomon Islands: New Georgia (type) and small islets round the northern part of Isabel Island [the latter locality may be erroneous] (3 ♀).

(h): *P. sarpedon anthedon* Feld. [♂, ♀].

Seba, *Thes.* IV. t. 37. f. 3. 4. 15. 16 (1765).

Papilio Eques Trajanus sarpedon, Houttuyn (*vec* Linné, 1758), *Naturl. Hist.* I. 11. p. 198. n. 14 (1767) (*p.p.*): Cramer, *Pap. Ez.* III. p. 39. t. 122. f. c. D (1779) (Amboina); Goeze, *Ent. Beytr.* III. 1. p. 36. n. 15 (1779) (*p.p.*): Jablonsky & Herbst, *Naturs. Schmetz.* 11. p. 87. n. 25. t. 10. f. 4. 5 (1787).

Papilio sarpedon, Godart, *Enc. Meth.* IX. p. 46. n. 62 (1819) (*p.p.*): Guér., *Voy. Astrol.*, *Ent.* p. 44. n. 12 (1832) (*p.p.*); Boisd., *Spec. Gén. Lep.* I. p. 235. n. 57 (1836) (*p.p.*): De Haan, *Verh. Nat. Gesch. Ned. overz. bez.* p. 34 (1840) (*p.p.*); Koch, *Indo-Austr. Lep. Fauna* p. 39 (1865) (*p.p.*); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 204 (1884) (*p.p.*).

Papilio anthedon Felder, *Verh. z. b. Ges. Wien* p. 305. n. 217. & p. 359. n. 124 (1864) (Amboina).

Papilio sarpedon var. *moluccensis* Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 65. sub n. 110 (1865) (Ceram; Buru; Batjan; Halmahera).

Papilio sarpedon var. *anthedon*, Staudinger & Schatz, *Exot. Schmetz.* I. p. 9. t. 6 (♂) (1881); Ribbe, *Iris* II. p. 210. n. 11 (1890) (Ceram); Röber, *Tijdschr. v. Ent.* p. 275 (1891) (Ceram).

In this and the next subspecies the submarginal spots to the hindwings are large and strongly arched, and are, like the median band, much more blue than in the other subspecies of *P. sarpedon* L.

The median band of the wings is sometimes scarcely broader than in certain examples of the Celebesian race. On the underside of the forewings there is often an almost complete series of submarginal whitish lunules. In one of my examples from Amboina the discal red markings on the underside of the hindwings are also faintly marked above.

Hab. Amboina (4 ♂); Ceram (1 ♂); Buru; Batjan (1 ♂); Halmahera (1 ♂, 1 ♀).

(i): *P. sarpedon milon* Feld. [♂].

Papilio milon Felder, *Verh. z. b. Ges. Wien* p. 305. n. 216 (1864) (Celebes; *nom. nud.*); id., *Reise Novara, Lep.* I. p. 62. n. 48 (1865) (Celebes); Rothsch., *Iris* V. p. 442 (1892) (Celebes).

Papilio miletus Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 65. n. 111. t. 7. f. 2 (♂) (1865) (Macassar; Menado); Holland, *Tr. Boston N. H. Soc.* XXV. p. 78. n. 134 (1890) (S. Celebes); Rothsch., *Iris* V. p. 442 (1892) (Celebes).

Papilio sarpedon var. *milon*, Piepers & Snellen, *Tijdschr. v. Ent.* XXI. p. 38. n. 150 (1878).

Papilio sarpedon var. *miletus*, Oberthür, *Et. d'Ent.* IV. p. 59. sub n. 144 (1879) (Celebes).

Costal margin strongly arched; median band narrower than in *anthedon* Feld. The specimens from Celebes, Sulla Islands, and Talaut Island do not differ subspecifically. The median band of the wings is somewhat variable in breadth.

(b²): ab. *milonides* Honr.

Papilio sarpedon var. *milon* ab. *milonides* Honrath, *Berl. E. Zeit.* XXVIII. p. 397 (1884) (Macassar).

Cellular portion of the median band of the hindwings abbreviated anteriorly, and therefore widely separated from the costal white spot.

Hab. Celebes (14 ♂, 1 ♀); Sula Islands (1 ♂, 1 ♀); Talaut Island (1 ♀; W. Doherty *leg.*).

195. *Papilio cloanthus* Westw. [♂, ♀].

Papilio cloanthus Westwood, *Arc. Ent.* I. p. 42. t. 11. f. 2 (*underside*) (1841) (N. India); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 116 (1846) (N. India; Assam); Hutton, *Tr. Ent. Soc. Lond.* V. p. 51. n. 13 (1847) (Mussooree, from end of April throughout the summer); Kollar, in Hügel's *Kaschmir* IV. 2. p. 405. t. 2. f. 1. 2 (1848) (Massuri); Gray, *Cat. Lep. Ins. B. M.* I. p. 28. n. 136 (1852) (N. India); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 112. n. 225 (1857) (N. India); Feld., *Verh. z. b. Ges. Wien* p. 304. n. 213. & p. 349. n. 120 (1864) (Darjeeling); Assam; Caschmir; Laug, *Ent. Mo. Mag.* p. 101 (1864) (N.W. Himal., 5000 to 7000 feet); Moore, *P. Z. S.* p. 757 (1865); Oberth., *Et. d'Ent.* IV. p. 60. n. 146 (1879) (India); Standing & Schatz, *Esot. Schmett.* I. p. 9. t. 6 (♂) (1884); Butl., *P. Z. S.* p. 376. n. 81 (1886) (W. India); Butl., *Ann. Mag. N. H.* (6). I. p. 206 (1888) (N.W. India); Elwes, *Tr. Ent. Soc. Lond.* p. 434. n. 429 (1888) (Sikkim; Khasia Hills, 6000 feet; rapid flight).
Dalchini cloanthus, Moore, *P. Z. S.* p. 257 (1882) (N.W. Himal.); Swinh., *Tr. Ent. Soc. Lond.* p. 314. n. 394 (1893) (Khasia Hills).
Papilio (Dalchini) cloanthus, Doherty, *Journ. As. S. Beng.* p. 135. n. 223 (1886) (Kumaon; 2000 to 7000 feet); Nicéx., *Gazetteer of Sikkim* p. 174. n. 497 (1894) (Sikkim; from April till October; 2000 to 4000 feet).

Three geographical forms are known.

(a): *P. cloanthus* Westw., forma typ. [♂, ♀].

I have a *female* specimen from Kulu, North-West India, in which the green parts are enlarged; the two cellular spots of the forewings are merged together, the black band inside the submarginal line of the forewings is as narrow as that outside the line. The *male* from the same locality is not different from Sikkim examples.

The spot in the end of the cell of the forewings has in *P. cloanthus* Westw. the same position as a minute spot referred to under *P. sarpyelon imparilis* mihi. As in all the allied species the *female* does not essentially differ from the *male*, except (of course) in the absence of the abdominal fold to the hindwings.

Hab. North India: Assam (2 ♂), Sikkim (14 ♂, 1 ♀), Nepal, North-West India (Kulu; 1 ♂, 1 ♀); Shan States (4 ♂).

Not yet found in the Malay Peninsula, where it certainly will turn up, as a subspecies of *P. cloanthus* Westw. occurs in Sumatra.

(b): *P. cloanthus clymenus* Leech [♂].

Papilio cloanthus var. *clymenus* Leech, *Butt. from China*, etc. p. 523. t. 32. f. 2 (1893).

Green markings smaller than in *P. cloanthus*; median nervure, its upper two branches and part of its lower branch black. Black area of the hindwings much broader; the portion inside the submarginal spots almost twice as broad at the anterior margin of the wing as in *P. cloanthus*. *Female* not described; unknown to me; is probably of a less deep black tint than the *male*.

Hab. Central and Western China (17 ♂).

A specimen from Ichang in my Museum is indistinguishable from certain Sikkim examples.

(c): *P. cloanthus sumatranus* Hagen.

♂ ♀. *Papilio cloanthus* var. *sumatranus* Hagen, *Iris* VII. p. 27. sub n. 33 (1894) (Sumatra).

Markings yellowish green. The first submarginal spot of the hinder wings stands in the middle of the black margin; four marginal white lunules, two before and two behind the tail; greenish area of the underside of the forewings densely scaled between lower median nervule and inner margin.

Hab. Sumatra (3 ♂).

XXXVII. AGAMEMNON-GROUP.

Agrees in structure with the preceding group. The green spots of the upperside are scaleless; the spots beneath are liable to lose the scales in *P. agamemnon* L.

196. *Papilio macfarlanei* Butl. [♂, ♀].

Papilio Eques Achirus aegistus, Cramer (*ave* Linné, 1764), *Pap. Er.* III. p. 81. t. 241. f. c. b. (1782) (Amboina); Jablonsky & Herbst, *Naturs. Schmett.* III. p. 104. n. 82. t. 36. f. 1. 2 (1788) ("America" *loc. err.*).

Zetides aegistus, Hübner, *Verz. bek. Schmett.* p. 86. n. 885 (1816).

Papilio aegistus, Godart, *Enc. Méth.* IX. p. 47. n. 64 (1819); Boisd., *Spec. Gén. Léop.* I. p. 231. n. 50 (1836); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 108 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 129 (1852); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 231. & p. 351. n. 130 (1864) (Amboina; Batjan); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 67. n. 117 (1865) (Ceram; Batjan; Gilolo; Aru); Kirsch, *Mittl. Mus. Dtsch. I.* p. 113. n. 14 (1877) (Kordo; Ansus; Rubi); Oberth., *Et. d'Ent.* IV. p. 58. n. 133 (1879) (Ternate; "Sangir," "Celebes" *loc. err.*); id., *Ann. Mus. Cr. Gen.* XV. p. 477. n. 23 (1880) (Ternate); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 204 (1884) (Amboina); Standing, & Sebatz, *Exot. Schm.* I. p. 10 (1884); Ribbe, *Iris* II. p. 210. n. 13 (1890) (Ceram); Röber, *Tijdschr. v. Ent.* XXXIV. p. 275 (1891) (Ceram).

Papilio macfarlanei Butler, *P. Z. S.* p. 471. n. 30 (1877) (N. Guinea).

There are two local forms.

(a): *P. macfarlanei* Butl., forma typ. [♂, ♀].

About *P. aegisthus* L. see p. 449.

The examples from the different islands of the Moluccas, Waigeu, and New Guinea, though rather variable in the size and number of the markings in every locality, cannot be separated subspecifically.

The discal band to the hindwings is sometimes much reduced in length, especially often in the *female*, which does not essentially differ from the *male*, except in the absence of the abdominal fold to the hindwings.

Hab. New Guinea (2 ♂, 2 ♀); Waigeu (1 ♂, 1 ♀); Aru; Halmahera (3 ♂, 3 ♀); Ternate (1 ♂); Batjan (6 ♂, 3 ♀; Amboina (4 ♂, 2 ♀); Ceram (1 ♂, 1 ♀).

(b): *P. macfarlanei seminiger* (Butl.) [♂, ♀].

Zetides seminigra Butler, *Ann. Mag. N. H.* (5). X. p. 153. n. 30 (1882) (New Britain).

♀. *Papilio aegistus* var. *aegistiades* Honrath, *Berl. E. Zeit.* p. 250 (1888) (Ralum, N. Britain).

The spots of the hindwings are nearly all obliterated.

Hab. New Britain.

Dr. A. G. Butler compares this *Papilio* with *P. agamemnon*, while it really belongs to *P. macfarlanei* Butl., according to the description and the type-specimen.

In *P. macfarlanei* Butl. the spots of the hindwings are sometimes also partly obliterated as said above, and such specimens come very close to *seminiger*.

197. *Papilio arycles* Boisd. [♂, ♀].

Papilio arycles Boisduval, *Spec. Gén. Léop.* I. p. 231. n. 51 (1836) (Java or Sumatra?; *spec. imperf.*); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 110 (1846) (Singapore; Sumatra; "Nepaul" *loc. err.*); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 131 (1852) ("N. India" *loc. err.*); Penang; Singapore; Borneo); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 234. & p. 351. n. 132 (1864); Druce, *P. Z. S.* p. 357. n. 25 (1873) (Java; Sumatra); Butl., *Tr. Linn. Soc. Lond.* (2). *Zool.* I. p. 552. n. 6 (1877) (Mal. Pen.); Oberth., *Et. d'Ent.* IV. p. 58. n. 134 (1879) "Singapore" *specim. typ.*, see Boisd.); Dist., *Rhop. Mal.* p. 362. n. 27. t. 32. f. 5 (1885) (♂, ♀; Mal. Pen.); Standing, *Iris* II. p. 16 (1889) (Palawan); Hagen, *Berl. E. Zeit.* p. 155. n. 180 (1892) (Banka I.); Butl., *P. Z. S.* p. 121 (1892) (Sandakan, N. Borneo).

Papilio rana Felder, *Wien. Ent. Mon.* IV. p. 391. n. 1 (1860) (Malacca); id., *Verh. z. b. Ges. Wien* p. 306. n. 235 (1864); id., *Reise Novara, Lep.* I. p. 71. n. 54. t. 12. f. b (1865); Wall., *Tr. Linn. Soc. Lond.* XXX. p. 68. n. 119 (1865) (Malacca; Sumatra; rana Feld., probably the same as *arycles* Boisd.); Standing, & Schatz, *Exot. Schmett.* I. p. 10 (1884).

Staudinger [*Iris*, II., p. 16 (1889)] mentions a specimen which is devoid of the costal red mark on the underside of the hindwings; I have a specimen which has that spot indicated by a few red scales visible under a lens. Sometimes the red colour of this and the other red spots on the hindwings changes into yellow.

Hab. Malacca (5 ♂); North-West Siam (1 ♂); Sumatra (4 ♂); Java; Borneo; Palawan (5 ♂) This species stands intermediate between *P. agamemnon* L. and the *Papilio*s allied to *P. eurypyglus* L.

198. *Papilio agamemnon* L. [♂, ♀, metam.].

Papilio Eques Achirus agamemnon Linné, *Syst. Nat.* ed. x. p. 462. n. 21 (1758) (China); id., *Mus. Lud. Ur.* p. 202. n. 21 (1764); Houtt., *Naturl. Hist.* I. 11. p. 202. n. 21 (1767); Linné, *Syst. Nat.* ed. xii. p. 748. n. 22 (1767); Mull., *Naturs.* V. 1. p. 572. n. 22 (1774); Fabr., *Syst. Ent.* p. 455. n. 51 (1775); Goeze, *Beutr.* III. 1. p. 49. n. 22 (1779); Cramer, *Pap. Er.* II. p. 151 (1779); Fabr., *Spec. Ins.* II. p. 20. n. 81 (1881); id., *Mont. Ins.* II. p. 10. n. 92 (1787); Jablonsky & Herbst, *Naturs. Schmett.* III. p. 192. n. 111. t. 48. f. 1. 2 (1788); Römer, *Gen. Ins. Linn. & Fabr.* p. 68. t. 13. f. 3 (1789); Fabr., *Ent. Syst.* III. 1. p. 33. n. 98 (1793); Esper, *Anal. Schmett.* p. 183. t. 46. f. 1. 3 (1796).

Papilio dorylus Sulzer, *Ges. d. Ins.* t. 13. f. 3 (1776).

Papilio aegistus, Cramer, *Pap. Er.* II. p. 15. t. 106. f. c. D (1776).

Iphiclides agamemnon, Hübner, *Verz. bek. Schmett.* p. 82. n. 841 (1816).

Papilio agamemnon, Donovan, *Ins. of China* t. 27. f. 2 (1798); Godart, *Enc. Méth.* IX. p. 46. n. 63 (1819); Boisd., *Spec. Gén. Lép.* I. p. 230. n. 40 (1836) (*p.p.*); Blanch., *Hist. Nat. Ins.* III. p. 421. n. 4 (1841); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 14. n. 109 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 27. n. 130 (1852); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 114. n. 229. t. 3. f. 9 (*l.*) 9a (*p.*) (1857); Vollenh., *Tijdschr. v. Ent.* III. p. 76. n. 44 (1860) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 306. n. 233. & p. 351. n. 131 (1864) (*p.p.*); Reak., *Proc. Ent. S. Phil.* p. 478. n. 22 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 67. n. 118 (1865); Koeh., *Indo-Austr. Lep. Fauna* p. 41 (1865) (*p.p.*); Moore, *P. Z. S.* p. 757 (1865) (Bengal); Semper, *Verh. z. b. Ges. Wien* p. 698 (1867) (Philippine Is.; metam.); Druce, *ibid.* p. 108. n. I (1874) (Siam); Piepers, *Tijdschr. v. Ent.* p. 70 (1876) (Batavia); Butl., *Tr. Linn. S. Lond.* (2). *Zool.* I. p. 552. n. 7 (1877) (Mal. Pen.); Moore, *P. Z. S.* p. 841 (1878) (Tenasserim); Oberth., *Et. d'Ent.* IV. p. 59. n. 135 (1879); Elwes, *P. Z. S.* p. 873 (1881); Dewitz, *Nor. Act. D. Sc. Nat.* 44. p. 265. t. 2. f. 4. A. B (*l.*, *p.*) (1882) (Philipp.); Aurivill., *Kongl. Sc. Vet. Ak. Hand.* XIX. 5. p. 24. n. 21 (1882); Standing & Schatz, *Exot. Schmett.* I. p. 9. t. 6 (♂) (1884); Kheil, *Rhop. Nias* p. 37. n. 143 (1884) (Nias); Butl., *Ann. Mag. N. H.* (5). XVI. p. 343. n. 107 (1885) (Manipur); Dist., *Rhop. Mal.* p. 363. n. 28. t. 32. f. 7 (1885) (Mal. Pen.); Dist. & Pryer, *Ann. Mag. N. H.* (5). XIX. p. 274. n. 183 (1887) (Sandakan); Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 70 (1887) (Hainan); Piepers, *Tijdschr. v. Ent.* p. 341. t. 7. f. 1-7 (1888) (Java, larva); Elwes, *Tr. Ent. Soc. Lond.* p. 437. n. 433 (1888) (Sikkim, common up to 3000 feet from April to December); Standing., *Iris* II. p. 16 (1889) (Palawan); Aitk. & Davids., *Journ. Bombay N. H. Soc.* p. 363. n. 67 (1890) (life hist.); Hagen, *Deutsch. E. Z. it.* p. 155. n. 181 (1891) (Banka I.); Snellen, *Midden-Sumatra* II. p. 25. n. 5 (1892); Oberth., *Et. d'Ent.* XVII. p. 4 (1893) (Tonkin); Hagen, *Iris* VII. p. 28. n. 35 (1894) (Sumatra).

Papilio agamemnon var. *rufescens* Oberthür, *Et. d'Ent.* IV. p. 58. sub n. 135 (1879) (China; greasy specim.?).

Zetides agamemnon, Moore, *Lep. Ceyl.* I. p. 145. t. 63. f. 2. 2a (*l.*) (1881) (Ceylon); id., *Journ. Linn. Soc. Lond.* XXI. p. 50 (1889) (Mergui); Swinh., *Tr. Ent. Soc. Lond.* p. 314. n. 399 (1893) (Khasia Hills).

Zethes (?) *agamemnon*, Swinhoe, *P. Z. S.* p. 145. n. 144 (1885).

Papilio (*Zetides*) *agamemnon*, Doherty, *Journ. As. Soc. Beng.* p. 136. n. 226 (1886) (Kumaon); Wood-Mas. & Nicéw., *ibid.* p. 375. n. 183 (1886) (Cachar); Elwes & Nicéw., *ibid.* p. 437. n. 140 (1886) (Ponsekai); Hamps., *ibid.* p. 364 (1888) (Nilgiri Hills, 1000 to 7000 feet); Ferguson., *Journ. Bombay N. H. Soc.* p. 446 (1891) (Travancore); Nicéw., *Gazetteer of Sikkim* p. 175. n. 591 (1894) (Sikkim; common at low elevations throughout the year).

Papilio agamemnon var., Snellen, *Tijdschr. v. Ent.* XXXVII. p. 71. t. 3. f. 3 (1894) (Java; spots orange yellow instead of green).

This *Papilio* ranges in several races over the whole of the Indo-Australian Region, and is apparently much more abundant in the western parts of its range than

further east. Though *P. agamemnon* is a rather variable species, the distinguishing characters of the different local forms are not so conspicuously marked as in many of the other wide-ranging Papilios. The races inhabiting the Indo-Malayan Sub-region, and Celebes, Wetter, Dammer, Tenimber, have the wings more elongate than those from the Papuan Subregion. Generally the tails of the males are shorter than in the other sex, especially so in the Moluccan and Papuan forms. The red markings on the underside of the hindwings are much feebler in the western than in the eastern forms of *P. agamemnon*; the spot behind the costal margin chiefly is very conspicuous in the Moluccan races; at the anal angle there is mostly only one red spot present; but in the forms from the Nicobars, Moluccas, and the Solomon Islands, the lowest spot of the discal row of greenish markings, standing between the two lower median nervules, is also covered with red scales, and most of the specimens from Guadalcanar (Solomon Islands), and my two Nicobar examples, have a number of additional minute red spots in the basal parts of the middle cellules, well separated from the discal, extra-cellular, row of greenish white spots, and thus remind one in some way of the red discal line on the underside of the hindwings of *P. aristeus* Cram. and its allies.

Wallace's *local form c* (from Malacca, Sumatra, Borneo, Java) cannot be separated from the typical *P. agamemnon* from the Mainland and the Philippines; the characters "size small; tails very short" by which Wallace distinguished his *local form c* apply only to some of the specimens. Generally the hinder angle of the forewings is more oblique in the individuals from North, West, and South India and Ceylon.

The ten races of *P. agamemnon* L. can be distinguished as follows:—

- A. Underside of the hindwings with one red spot near anal angle.
- a. Green discal mark between lower median nervules on upperside of hindwings about twice as broad (or more) as the black interspace before it.
 - a². Third macular band to forewings (counted from the base) consisting of five spots; front of the head with two pinkish spots anteriorly. *P. agamemnon* L.
 - b². Third macular band consisting of four spots. Head without pinkish spots. subsp. *ligatus* m.
 - b. That mark as broad as the interspace before it, or narrower. On the underside of the forewings the discal spot before the upper median nervule is entirely covered with scales, while in typ. *agamemnon* this spot is, towards cell, free from scales and here green.
 - a¹. Costal margin of forewings evenly arched. Size small. subsp. *erilis* m.
 - b¹. Costal margin of forewings suddenly arched near base. Size large. subsp. *celebensis* Fickert.
- B. Underside of hindwings in anal region with a second red spot standing between lower median nervules.
- c. Submarginal and discal spots on upperside of hindwings obliterated.
 - c¹. Spots of the median band of forewings below scaled. subsp. *neopommeranius* Honr.
 - c². These spots only partly scaled (as in typical *agamemnon* L.). subsp. *argynnus* Druce.

- d.* These spots not obliterated, or only a few of them.
- e.* Underside of hindwings with a minute red spot within the angle formed by the upper discoidal and the second discocellular nervules.
- e*². Five upper spots in the cell of the forewings larger than the submarginal and discal spots to the hindwings above.
subsp. *salomonis* m.
- d*². These spots smaller than the submarginal and discal spots to the hindwings.
subsp. *decoratus* m.
- f*¹. Underside of the hindwings without that spot.
- e*². Postcellular (discal) spots on the upperside of forewings thrice, or more, as large as the other spots of the upperside; the spot between the lower median nervules twice as broad as the black interspace before it (as in *P. agamemnon* typ.).
subsp. *plithenes* Feld.
- f*². Spots on the upperside of wings not so very much different in size, the discal marks on forewings being small, that between lower median nervules narrower than the black interspace before it (as in subsp. *celebensis*).
subsp. *guttatus* m.

(*u*): *P. agamemnon* L., forma typ. [♂, ♀, metam.].

The two postcellular spots on the underside of the forewings, situated between the median nervules, have the interior portion bare of scales, while the exterior portion is densely covered with white scales; in the following local form these spots are almost entirely bare of scales, or the outer portion is much less densely scaled, so that the green and white portions of the spots are not so well defined as in typical *P. agamemnon*. In a specimen from Nias Island there are a few red scales within the cell of the hindwings on the underside, and also a minute red spot in the angle between the second discocellular and upper discoidal nervules. The length of the tails is very variable; in the *fewde* sex the tails are often narrowed at the base, and then appear to be slightly spatulate; *mides* with the tails obliterated are:—

(*a*²): ♂-ab. *aejisthus* L.

Papilio aejisthus Linné, *Amoen. Acad.* VI. p. 401. n. 49 (1763) (China!).

Papilio Equus aejisthus Linné, *Syst. Nat.* ed. xii. p. 754. n. 48 (1767) (China).

Papilio agamemnon var. *anona* Oberthur, *Et. d'Ent.* IV. p. 58. sub n. 135 (1879) (Borneo; now Dodinga).

All the authors which I have looked up, except Esper, Montrouzier, and Butler, have applied the name of *P. aejisthus* L. to a species occurring in the Moluccas and New Guinea which Dr. A. G. Butler described in *P. Z. S.* p. 471 (1877) as a new species, under the name of *P. macfarlanei* (see n. 196). They have been misled by Cramer, who first figured a typical *P. agamemnon* as *P. aejistus* L., and afterwards correcting this error made a second mistake in figuring a quite different species (now = *macfarlanei* Bul.) as *P. aejistus*. Linné's first description is as follows:—

“ 49. PAPILIO *Aejisthus* E. T alis fuscis viridescenti-maculatus; subtus subiucarnatus maculis virescentibus rarioribus.

“ *Habitat* in China.

"Magnitudo *Pop. Apollinis*. Alae omnes supra nigricantes maculis numerosis luteo-virescentibus, quarum corpori propiores magis longitudinales ad ductum corporis. Subtus omnes subincarnatae, maculis rarioribus, minoribus, virescentibus, quarum una alterave in alis posticis subocellata centro nigro. Similis *Agamemnoni*."

The wings being maculated with green fits to several *Papilio*s; but the underside being subincarnate, and having the spots scarcer and smaller, certainly applies to a form of *P. agamemnon* and to no other Indo-Australian species, and so does *macula subocellata centro nigro* on the underside of the hindwings. In *Syst. Nat.* ed. xii. p. 754 Linné mentions the form of the hindwings.

"*Aegistus*. 48. P.E. alis dentatis fuscis virescente maculatis; subtus subincarnatis maculis virescentibus rarioribus. *Amen. acad.* 6 p. 401. n. 49.

"*Habitat* in China.

"*Similis P. Agamemnoni*."

It may have been the character "*alis dentatis*" which has induced Cramer to identify his *aegistus* with Linné's species; but there occur also tailless *P. agamemnon* which show the wings "dentate." The basal markings on the wings which are *magis longitudinales ad ductum corporis* apply much better to *P. agamemnon* than to Cramer's *aegistus* (= *macfarlanei* Butl.). Linné does not mention the red spots on the underside of the hindwings, which are present in *P. agamemnon* as well as in *P. macfarlanei*, *P. arycles*, etc.; these red spots are sometimes very faint in *P. agamemnon* from India and Malaya.

Now, as there is no character in Linné's descriptions which speaks against our identification, but several which directly point to *P. agamemnon*, I am satisfied that Linné's *P. aegisthus* is based on a tailless specimen of that species. But to which race of *P. agamemnon* must the name of *aegisthus* be united?

Since many of Linné's Indo-Australian species, with the "*Hab. Asia*," or "China," or "Ind. or," came from Amboina—[Linné received very many of his species from Holland, and that accounts for his species being mostly Amboina and Surinam forms]—I first thought that *P. aegisthus* might be the same as Felder's *P. plithenes*, of which the type-specimen is of the size of *Parnassius apollo* ("Magnitudo *P. Apollinis*"). Small specimens occur, however, occasionally also in India and Malaya; tailless examples are also found in the Indo-Malayan region; and considering that in Linné's specimen the red spots on the underside of the hindwings were probably obliterated, a character which is often met with in the typical race of *agamemnon*, there is no reason to doubt the patria "China" of Linné's *aegisthus*; and I must, therefore, restrict the name of *aegisthus* to the tailless males of the typical race of *P. agamemnon* L., to which specimens Oberthür gave the name of *anoura*.

Hab. China (2 ♂); Hainan; Tonkin; Burma; North India (10 ♂, 9 ♀); North-West India (1 ♀); West and South India; Ceylon (1 ♂, 1 ♀); Tenasserim (1 ♂); Malacca (11 ♂); Sumatra (4 ♂); Nias (5 ♂, 2 ♀); Java (7 ♂, 3 ♀); Natuna Islands (2 ♂, 1 ♀); Borneo (15 ♂, 3 ♀); Balabac (1 ♂); Palawan (2 ♂, 1 ♀); Philippines (1 ♂, 1 ♀).

Orza, Léop. Jap. p. 10 n. 5. 1869, records this species from the warm parts of the Japanese empire.

(b) : *P. agamemnon ligatus* subsp. nov. [♂, ♀].

Papilio oegistus, Montrouzier, *Ann. Soc. Phys. Nat. Lyon* p. 400 (1856) (Woodlark L); id., *Essai Faune Woodlark (Separat.)* p. 122 (1857).

Papilio agamemnon local form f, Wallace, *Tr. Linn. S. Lond.* XXV. p. 68. sub n. 118 (1865) (New Guinea; Aru; Waigeu).

Papilio agamemnon, Koch (*nec* Linné, 1758), *Invo-Austr. Lep. Fauna* p. 41 (1865) (*p.p.*); *Butl., P. Z. S.* p. 291. n. 101 (1874); Kirsch, *Mith. Mus. Dresd.* I. p. 113. n. 15 (1877) (New Guinea); Semper, *Journ. Mus. Godaffroy* p. 45. n. 139 (1878) (Cape York); Mathew, *Proc. Linn. Soc. N. S. Wales* p. 264 (1885); Ribbe, *Iris* p. 78. n. 13 (1886) (Aru Is.); Lucas, *Proc. Roy. Soc. Queensl.* VIII. p. 68 (1892) (Yeppoon); Grose-Smith, *Nov. Zool.* I. p. 333. n. 13 (1894) (New Guinea).

Papilio argistus, *Butler (nec* Linné, 1763), *P. Z. S.* p. 471. n. 31 (1877) (New Guinea).

Forewings narrower than in typical *P. agamemnon*, outer margin less concave; the green markings larger; the two discal spots between submedian and lower median veins completely merged together to a rather broad streak. Hindwings shaped as in the Amboina race, *i.e.*, shorter and broader than in typical *P. agamemnon*, tails much reduced in both sexes. Underside, postcostal black mark large, its interior red border long, strongly marked and more arched than in *P. agamemnon*; inside each of the submarginal green spots, joined to these spots, stands a black marking which is larger than in *P. agamemnon*.

Head, like all the eastern races, devoid of the pink colour which is present anteriorly in *P. agamemnon*.

The females are apparently less rare than in India, as in many of the widespread Eastern *Papilios*.

Hab. New Guinea (type; 3 ♂, 9 ♀); Waigeu Island (1 ♂, 2 ♀); Aru Islands; Queensland (5 ♂, 5 ♀); Woodlark Island (?).

Montrouzier's description of the Woodlark *agamemnon*, which he calls "*P. oegistus* L." contains two characters which point to the present race; there is only one red spot in the anal region on the underside of the hindwings, and the third macular row on the forewings consists of four markings, the third of which (behind cell) is long.

The Queensland examples have the tails longer than typical *ligatus* m.

(c) : *P. agamemnon exilis* subsp. nov. [♂, ♀].

Papilio agamemnon, Boisduval (*nec* Linné, 1758), *Spec. Gén. Léop.* I. p. 230. n. 49 (1836) (*p.p.*);

Doherty, *Journ. As. S. Beng.* p. 193. n. 114 (1891) (Sumba; Sambawa).

Papilio agamemnon local form u, Wallace, *l.c.* p. 67. sub n. 118 (1865) (Timor; Flores).

Smaller than all the other races of *P. agamemnon*. In the shape of the wings similar to typical *P. agamemnon*, but the tails slenderer. Markings of the forewings as small as in the Celebesian and Halmaheran races; the fourth spot of the fourth row, which ends near the anal angle, stands with the other spots of the same row in a straight line, while it is situated a little further to the outer margin in *P. agamemnon* L. and *celebensis* Fickert.

In the typical specimen from the Tenimber Islands all the postcellular spots on the underside of the forewings are entirely covered with whitish scales as in the Halmaheran race, and the markings to the hindwings are minute. In the Wetter specimen the markings on the hindwings are a little larger, and of the postcellular spots of the forewings below only that above the upper median nervule is completely sealed; in this respect the Wetter specimen approaches typical *agamemnon*, which have the interior portion of the three upper (large) postcellular spots green, *i.e.*, devoid of scaling.

I have not examined specimens from Timor, Flores, Sumba, and Sambawa; but these are doubtless intermediate between *exilis* from Tenimber and *agamemnon* proper, and will best go with *exilis*.

Hab. Tenimber Islands (type; 1 ♀, W. Doherty, June to July, 1892); Dammer (W. Doherty: July, 1892; 1 ♀); Timor; Wetter (W. Doherty: May 1892; 1 ♂); Flores; Sumba; Sambawa.

(d): ***P. agamemnon decoratus*** subsp. nov. [♀].

Papilio agamemnon (nec Linné, 1758), Moore, *P. Z. S.* p. 592 (1877) (Nicobar & Andaman Is.); Wood-Mas., *Journ. As. S. Beng.* p. 238, n. 69 (1880) (Andaman Is.); id. & Nicéy., *ibid.* p. 237, n. 58 (1881) (Kamorta); iid., *ibid.* p. 253, n. 97 (1881) (Andaman Is.); iid., *ibid.* p. 18, n. 62 (1882) (Kamorta).

Differs from *P. agamemnon* L. in the smaller spots of the median row to the forewings; in the spots before the upper median branch on the underside being entirely scaled; in the short tails; and especially in the pattern of the underside of the hindwings; the red post-costal spot is relatively small, but the red part has much increased against the black part; besides the large red anal mark and the mark before the first discocellular veinlet, there is a large red spot in the lower median cellule, a smaller red spot in each of the three preceding cellules, and a streak-like red spot at the base of the lower median cellule.

In the amount of red on the underside of the hindwings this form comes nearest to *P. agamemnon salomonis* m.; but can be distinguished by the spots on the hindwings being much larger than those in the apical half of the cell to the forewings; by the discal spot of the forewings below, which stands before the upper median nervule, being completely scaled; by the post-costal red and black mark to the hindwings being much smaller; and by the undersurface having that peculiar pinkish vinaceous colour which is found in typical *agamemnon* L.

In shape and size it resembles also *P. agamemnon plithenes* Feld.; the spots within the cell of the forewings are, however, much smaller; the post-costal red spot to the hindwings is smaller; the forewings are narrower; the spots on the hindwings are larger; and those of the submarginal row stand nearer the margin.

Andaman specimens I have not seen; they belong probably to this subspecies.

Hab. Nicobar Islands (Kamorta) (2 ♀); Andaman Islands (?).

(e): ***P. agamemnon celebensis*** Fickert [♂, ♀].

Papilio agamemnon local form d, Wallace, *l.c.* p. 67, sub n. 118 (1865) (Celebes).

Papilio agamemnon, Hopffer, *Stett. E. Zeit.* p. 19 (1874) (Celebes); Piepers & Snellen, *Tijdschr. v. Ent.* p. 38, n. 152 (1878) (Celebes); Westw., *Tr. Ent. Soc. Lond.* p. 468 (1888) (Great Sengir); Ribbe, *Iris* II. p. 211, sub n. 14 (1890) (Celebes); Holland, *Proc. Boston N. H. Soc.* XXV, p. 77, n. 133 (1890) (S. Celebes); Rothsch., *Iris* IV, p. 442 (1892) (Celebes).

(?) *Papilio agamemnon*, Snellen, *Tijdschr. v. Ent.* p. 276 (1890) (Tanaah-Djampea I., south of Celebes); Rober, *ibid.* p. 275 (1891) (*p.p.*; *end. subsp. aut. agam. typ.?*).

Papilio agamemnon var. *celebensis* Fickert, *Zool. Jahrb.* p. 730, sub n. 1a (1889).

Though Fickert does not give any other character of his var. *celebensis* than the size, there can be no doubt that he really meant the present race; the name of *celebensis*, however, will probably sink in future, as there is already a *Papilio codrus celebensis* Wall. which, in my opinion, will come into the same genus with *P. agamemnon* L.

Large. Forewings long, costal margin strongly arched in the basal region. Markings small on both wings.

In the specimens from Sangir Island (Sanghi, Sanghir) the green spots are somewhat larger.

Hab. Celebes (2 ♂, 2 ♀); Sula Islands (1 ♂, 1 ♀); Sangir Island (W. Doherty *leg.*; 2 ♂, 3 ♀).

(f): ***P. agamemnon guttatus*** subsp. nov. [♂, ♀].

Shape of wings as in *P. agamemnon plisthenes* Feld. Discal spots on forewings as small as in *celebensis*; spots on the hindwings about as large as those on the forewings, *i.e.*, larger than in *P. agamemnon plisthenes*; two red spots in anal region of the underside of the hindwings; postcellular spots on the underside of the forewings all scaled.

Males tailless.

Hab. Halmahera (type; W. Doherty: August, 1892) (1 ♂, 4 ♀); Ternate (1 ♂).

(g): ***P. agamemnon plisthenes*** Feld. [♂, ♀].

Seba, *Thes.* IV. p. 15. t. 37. f. 1. 2 (1765).

Papilio Eques Achirus agamemnon, Esper (*nov.* Linné, 1758), *Aust. Schmett.* p. 183 (*p.p.*). t. 46. f. 2 (1796).

Papilio agamemnon, Boisduval, *Spec. Gén. Lépi.* I. p. 230. n. 49 (1836) (*p.p.*); Oberth., *Ann. Mus. Civ. Genova* XV. p. 477 (1880) (*p.p.*); Pagenstech., *Jahrb. Nass. Ver. Nat.* p. 204 (1884) (*p.p.*); Röber, *Tijdschr. v. Ent.* p. 275 (1891) (*p.p.*).

Papilio plisthenes Felder, *Verh. z. b. Ges. Wien*, p. 305. n. 232 (1864) (*nom. nud.*); *id.*, *Reise Novara*, *Lep.* I. p. 70. n. 53 (1865) (Amboina).

Papilio agamemnon var. *plisthenes*, Ribbe, *Iris* II. p. 211. n. 14 (1890) (*p.p.*).

The markings of the hindwings are liable to obliteration, though the submarginal and discal spots are never entirely absent as in the subspecies *argynnus* and *neopommeranius*.

In the markings of the forewings *P. agamemnon plisthenes* comes close to *P. agamemnon*; the third row of markings (counted from the base of the wing) consists often of three spots instead of five, the two anterior within the cell and the two behind the cell being confluent to two short bands. The spots on the hindwings are always small; the submarginal row stands obviously farther from the outer margin than in *P. agamemnon* L. The red lunule bordering the postcostal black spot on the underside of the hindwings is large, and forms a semicircle; the two red spots in the anal region are very conspicuous in most specimens.

Two spots between the median branches of the forewings below partly scaleless.

Hab. Amboina (8 ♂, 4 ♀); Ceram (1 ♂, 2 ♀); Buru; Goram; Batjan (1 ♂, 1 ♀).

My two Batjan specimens belong to this race; I got them, however, from a dealer who, as I have found out several times, is not careful as regards the localities of the specimens; so that the locality "Batjan" may be erroneous.

(h): ***P. agamemnon salomonis*** subsp. nov. [♂, ♀].

Resembles *P. agamemnon plisthenes* Feld. Hindwings still broader; last submarginal spot of the forewings stands farther from the outer margin; markings of the hindwings smaller than the cellular spots to the forewings; the posterior spots of the median and submarginal rows as well as the first of the submarginal row absent; median spots of the underside of the forewings devoid of scales except at their external edges. Two red spots in the anal region of the underside of the

hindwings; often some more red spots, which are, however, minute, near the apex of the cell.

Hab. Solomon Islands: Guadalcanar Island (*type*: 3 ♂, 13 ♀), New Georgia (1 ♀), Alu (1 ♀).

In one ♀ the red postcostal spots to the hindwings below reaches the costal margin, being extended beyond the costal nervure, almost as in *P. macfarlanei* Butl.

(i): ***P. agamemnon argynnus*** Druce [♂, ♀].

Papilio agamemnon local form *b*, Wallace, *l.c.* p. 68, sub n. 118 (1865) (Key Is.).

Papilio argynnus Druce, *Ann. Mag. N. H.* (6), II, p. 235 (1888) (Key Is.).

Green markings of the hindwings more or less completely obliterated. Median row of spots on the underside of the hindwings scaleless, except at the outer edge of each spot.

Hab. Key Islands (in coll. Godman & Salvin).

(k): ***P. agamemnon neopommeranius*** Honr.

Papilio agamemnon, Salvin & Godm. (*acc* Linné, 1798), *P. Z. S.* p. 148, n. 34 (1877) (Duke of York I.).

Papilio agamemnon var. *neopommerania* Honrath, *Berl. E. Zeit.* XXXI, p. 350, t. 6, f. 4 (1887) [Neu Pommern (= New Britain)].

Differs from *P. agamemnon argynnus* Druce chiefly in the spots of the median row of the forewings being smaller and, on the underside, scaled.

Hab. New Britain (1 ♂, 1 ♀); Duke of York Island.

I have a specimen each from the Island of Ugi, close to Guadalcanar Island, and from the Pelew Islands (Palau Islands), which represent apparently two more local forms of *P. agamemnon* L.:—

(1) The *female* from the Pelew Islands has the forewings shaped as *P. agamemnon* L., but marked as *P. agamemnon guttatus* subsp. nov.; the hindwings are less broad than in *guttatus*, the tails reduced, the discal spots of the size of those of the median row of the forewings.

Underside: the postcellular spot above the upper median nervule on the forewings entirely scaled; the hindwings with one red spot in the anal region.

The front of the head is not pinkish anteriorly.

(2) The specimen (♀) from Ugi Island is very remarkable for the size of its markings. The black bands on the forewings separating the three basal green bands are scarcely of more than half the breadth of the latter; the three postcellular spots of the forewings between the lower median and lower discoidal nervules are regularly trapeziform, the black interstices between them of about a fifth the breadth of the spots. The markings of the hindwings are a little larger than in typical *P. agamemnon* L.

I must await further material before I can treat the Pelew and Ugi specimens as belonging to two more subspecies of *agamemnon*.

XXXVIII. WALLACEI-GROUP.

The species of this group differ from all the other Indo-Australian *Papilios* in the first and second subcostal branches to the forewings being anastomosed to the costal nervure.

199. *Papilio wallacei* Hew. [♂, ♀].

Papilio wallacei Hewitson, *Ex. Butt.* II. *Pap.* t. 3. f. 7 (1858) (New Guinea); Feld., *Verh. z. b. Ges. Wien* p. 305. n. 230 (1864); Kirsch, *Month. Mus. Dresd.* I. p. 113 n. 13 (1877) (Kordo & Mawéji, New Guinea).

Two local forms are known to me:—

(a): *P. wallacei* Hew., forma typ. [♂].

Varies somewhat in the breadth of the median band of the wings and in the number of the cellular and submarginal spots on the forewings.

Hab. New Guinea (1 ♂); Waigé (2 ♂); Aru (1 ♂).

(b): *P. wallacei rubrosignatus* subsp. nov. [♂, ♀].

Papilio wallacei, Wallace (*see* Hewitson, 1858), *Tr. Linn. Soc. Lond.* XXV. p. 66. n. 112 (1865) (Batjan; *see* Aru); Oberth., *Et. d'Ent.* IV. p. 58. n. 132 (1879) (Dodonga); Stauding. & Schatz, *Exot. Schm.* I. p. 10. t. 6 (♂) (1884) (Batjan; Halmahera).

This form differs from the New Guinea race in the middle spots of the median band on the underside of the forewings being devoid of white scales towards the cell, and in the hindwings bearing on the underside a number of discal red spots posteriorly, of which that between the lower median branches is the largest. The black and red costal streak which separates the greenish costal patch on the underside of the hindwings into two parts is broader at the subcostal nerve than in *P. wallacei* Hew.

Hab. Northern Moluccas: Batjan (type; W. Doherty: March 1892) (2 ♂, 1 ♀); Halmahera (2 ♂).

200. *Papilio browni* Godm. & Salv. [♂, ♀].

♀. *Papilio browni* Godm. & Salv., *P. Z. S.* p. 655 (1879) (N. Ireland).

Submarginal spots of forewings obsolete; median macular band narrow, chiefly behind; costal patch of hindwings much reduced; red costal mark on the underside of the hindwings not prolonged to the subcostal nerve; hindwings with some discal red spots posteriorly as in *P. wallacei rubrosignatus* Rothsch.

Hab. New Britain (2 ♂); New Ireland (2 ♂).

201. *Papilio hicetaon* Mathew [♂, ♀].

Papilio hicetaon Mathew, *P. Z. S.* p. 350 (1886) (Ugi I.).

Spots of the median band as large as in *P. wallacei* Hew.; submarginal spots mostly obliterated. Red costal mark on the underside of the hindwings larger than in *P. wallacei* Hew., the green mark outside it reduced to a narrow streak or absent; discal red spots as in *P. browni*.

Hab. Solomon Islands: Ugi & Gnadaleanar (5 ♂, 5 ♀).

In the collection of Messrs. Godman & Salvin is a female from Gnadaleanar Island which has the green spot outside the red costal mark on the underside of the hindwings as large as it is in certain examples of *P. browni*. True intergradates between *P. wallacei*, *P. browni*, and *P. hicetaon* are not yet discovered.

XXXIX. MACAREUS-GROUP.

The species of this group are all mimetic. Some of them resemble other mimetic *Papilio*s of the *elytia*-group, but can at once be distinguished by the first subcostal nervule of the forewings being anastomosed to the costal nervure. *Males* with a more or less developed abdominal fold to the hindwings as in the preceding groups XXX. to XXXVIII.

A. Discoidal cell of the hindwings very long and narrow; first discocellular nervule originating at about the basal sixth of the subcostal vein.

Note.—Scales of the white markings on the upperside of the wings (except the costal region of the hindwings) narrow; in *macareus*, *stratocles*, *deucalion*, *leucalion*, *thule*, the scales are hair-like; in the Indian *megarus* they are somewhat broader and are emarginate at the apex; in *megarus fleximacula* Rothsch. they are still broader, bidentate, and in *mequera* Stauding. almost normal, but narrower than the brown scales.—K. J.

a. Abdomen with four white lines, two on each side; middle line of the under surface black. *Males* with the abdominal margin of the hindwings (when the fold is expanded) provided with long hairs for its whole length, with a woolly scent-organ along this margin.

202. *Papilio macareus* Godart [♂, ♀].

Papilio macareus Godart, *Enc. Méth.* IX. p. 76. n. 144 (1819) (Java); Horsf., *Cat. Lep. Ins. Mus. E. I. C. I.* t. 5. f. 1 (1828) (Java); Lucas, *Lép. Ex.* p. 45. t. 23. f. 1 (1835) (Java); Boisd., *Spec. Gén. Léop.* 1. p. 374. n. 220 (1836) (Java); Doubl. Westw. & Hew., *Gen. Journ. Lep. I.* p. 21. n. 259 (1846) (*p.p.*); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 90. n. 182 (1857) (*p.p.*); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 262 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 62. n. 96 (1865) (*p.p.*); Oberth., *Et. d'Ent.* IV. p. 100. n. 320 (1879) (Java).
♂. *Papilio striatus* Zinken, *Nor. Act. Ac. Nat. Cur.* XV. p. 154. t. 14. f. 5 (1831) (Java).
♀. *Papilio astina* Westwood, *Cab. Or. Ent.* p. 20. t. 9. f. 3 (1848) (Java).

Five local forms are known to me:—

- (a): *P. macareus* Godart from Java;
- (b): *P. macareus indicus* n. from North India and Burma; Tenasserim; Malacca (?);
- (c): *P. macareus xanthosoma* Stauding. from Sumatra;
- (d): *P. macareus macaristus* Grose Smith from Borneo;
- (e): *P. macareus maccabæus* Stauding. from Palawan.

(a): **P. macareus** Godart, forma typ. [♂, ♀].

Mr. H. Fruhstorfer obtained the typical form of *P. macareus* Godart both in West and East Java; I have only two West Javan specimens before me, which are remarkably different from the Indian insect that most authors treat as *macareus* Godart. The hinder angle of the forewings of typical *macareus* is more rounded than in the Indian race, the postcellular white streaks are broader, the last but one is not or scarcely divided into two, the black line inside it being very thin or only exteriorly marked; the three short streaks of the discal row between the upper median and lower subcostal veins are not notched exteriorly. The first white streak on the hindwings is much narrower and shorter than in *indicus*; below, the costal emargin is not white. The white lines of the abdomen are much narrower; the vntral black middle line much broader

The *female*, described by Westwood as *P. astina*, of which the *type* is in the British Museum, is brown. Forewings, besides the submarginal spots, with three short white streaks in the apical region. Hindwings with submarginal spots and two small discal spots before and behind the lower median vein.

Hab. Java (H. Fruhstorfer, Sukabumi, 2000 feet; also East Java) (2 ♂).

(b): ***P. macareus indicus*** subsp. nov. [♂, ♀].

♂. *Papilio macareus* Doubl. Westw. & Hew. (*nec* Godart, 1819), *l.c.* I. p. 21. n. 259 (1846) (*p.p.*); Horsf. & Moore, *l.c.* I. p. 90. n. 128 (1857) (*p.p.*); Feld., *l.c.* p. 308. n. 262 (1864) (*p.p.*); Wall., *l.c.* p. 62. n. 96 (1865) (*p.p.*); Malacca!; Moore, *P. Z. S.* p. 756 (1865); Stauding. & Schatz, *Exot. Schneitt.* I. p. 6 (1884); Dist., *Rhop. Mal.* p. 356 (1885) (occurrence in Malacca doubtful); Elwes, *Tr. Ent. Soc. Lond.* p. 431. n. 421 (1888) (Sikkim, at low elevations during May and June); Haase, *Unters. üb. Mim.* p. 37 (1893); Oberth., *Et. d'Ent.* XVII. p. 6 (1893) (Tonkin).

Papilio aeneus var. *macareus*, Gray, *Cat. Lep. Ins. B. M.* I. p. 71 sub n. 327 (1852) (Sylhet).

Papilio (*Parantipopsis*, subg. nov.) *macareus*, Wood-Mason & Nicéy., *Journ. As. S. Boug.* p. 376. n. 186 (1886) (Rupacherra, Cachar); Elwes & Nicéy., *ibid.* p. 433. n. 125 (1886) (Tavoy & Siam); Nicéy., *Journ. Bomb. N. H. Soc.* VII. p. 345. n. 18. t. I. f. I (♂) (1892) (aberration); id., *Gazetteer of Sikkim* p. 173. n. 489 (1894) (Sikkim; single-brooded; rather rare; low outer valleys; from April to June).

Parantipopsis macareus, Swinhoe, *Tr. Ent. Soc. Lond.* p. 315. n. 410 (1893) (Khasia Hills).

Comes near typical *macareus*, but can easily be distinguished by the characters mentioned under (a).

The *female*, which is very rare and has not yet been described, differs from that of *macareus* in the forewings being devoid of all markings except the submarginal ones, and in the hindwings being provided with all the markings of the *male*, though these markings are shorter and less well defined than in that sex.

Hab. North India: Sikkim (11 ♂); Khasia Hills (8 ♂, 1 ♀); Shan States (2 ♂); Tenasserim; (?) Malacca.

My two specimens from the Siamese Shan States resemble in pattern the Bornean subspecies, all the streaks being narrower than in the North Indian race; most probably in the mountainous regions of the Malay Peninsula *macareus* is still more different, and will require a subspecific name of its own.

(c): ***P. macareus xanthosoma*** Stauding. [♂].

Papilio macareus, Grose Smith (*nec* Godart, 1819), *Ann. Mag. N. H.* (5). XX. p. 434 (1887) (Sumatra).

Papilio macareus var. *xanthosoma* Staudinger, *Iris* II. p. 7 (1889) (Sumatra); Hagen, *ibid.* VII. p. 20. n. 9 (1894) (Sumatra).

Differs from *P. macareus* Godart chiefly in the brown or yellowish brown colour of the upperside of the abdomen, and in the narrower white streaks on the wings.

Hab. Sumatra (1 ♂).

(d): ***P. macareus macaristus*** Grose Smith [♂].

Papilio macareus, Vollenhoven (*nec* Godart, 1819), *Tijdschr. v. Ent.* III. p. 88. n. 154 (1860) (Borneo); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 262 (1864) (*p.p.*); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 62. u. 96 (1865) (*p.p.*); Druce, *P. Z. S.* p. 356. n. 2 (1873); Elwes, *Tr. Ent. Soc. Lond.* p. 431. sub n. 421 (1888) (Borneo); Haase, *Unters. üb. Mim.* p. 37 (1893) (*p.p.*).

Papilio macaristus Grose Smith, *Ann. Mag. N. H.* (5). XX. p. 434 (1887) (Borneo).

Papilio macareus var. *borneensis* Staudinger, *Iris* II. p. 7 (1889) (Borneo).

The white streaks are very narrow compared with those of *P. macareus* Godart. *Female* unknown.

Hab. Borneo (19 ♂).

(c) : *P. macareus maccabaeus* Stauding. [♂].

Papilio macareus var. *maccabaeus* Staudinger, *Iris* II, p. 6 (1889) (Palawan).

Differs from *P. macareus* Godart in the discal white streaks and submarginal spots to the hindwings being much smaller; discal streaks of the forewings as broad as in that race.

Female unknown.

Hab. Palawan (5 ♂).

In this and the Bornean race the three spots outside the end of the cell are mostly merged together with the corresponding three streaks of the discal row; this is also the case in one of my Siamese specimens of *P. macareus indicus* m.

203. *Papilio xenocles* Doubl. [♂, ♀].

Papilio xenocles Doubleday, in Gray's *Zool. Misc.* p. 74 (1842) (Sylhet); Eriehs., Wiegmann's *Arch. f. Nat.* p. 248 (1844) (*xenocles* = ? *pollux* Westw.); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I, p. 20, n. 258. t. 1^o. f. 2 (♂) (1846) (N. India); Westw., *Arc. Ent.* II, p. 127. t. 79. f. 2 (♂) (1845); Gray, *Cat. Lep. Ins. B. M.* I, p. 71. n. 327 (1852) (Sylhet); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 90, n. 184 (1857) (Sylhet; Darjeeling); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 264. & p. 354. n. 152 (1864); Moore, *P. Z. S.* p. 840 (1878) (Upp. Tenasserim); Oberth., *Et. d'Ent.* IV, p. 100, n. 321 (1879) (Ind. bor.); Standing. & Schatz, *Exot. Schm.* I, p. 6. t. 3 (♂) (1884); Butl., *Ann. Mag. N. H.* (5). XVI, p. 348. n. 108 (1885) (N. Manipur); Elwes, *Tr. Ent. Soc. Lond.* p. 430. n. 420 (1888) (Sikkim, common up to 3000 feet; first *descript. of ♀*).

Papilio (Paranticopsis) xenocles, Wood-Mason & Nicéy., *Journ. As. S. Beng.* p. 376. n. 187 (1886) (Cachar) (*Paranticopsis* subg. nov., *sed nom. nud.*); Nicéy., *Gazetteer of Sikkim* p. 473. n. 488 (1894) (Sikkim; from April to November, up to 3000 feet).

Paranticopsis xenocles, Swinhoe, *Tr. Ent. Soc. Lond.* p. 315. n. 409 (1893) (Khasia Hills).

The *female* is dimorphic; from Sikkim and Bhutan I know only of such specimens which are almost identical with the *male*, except one specimen which approaches the palest examples of the Assam form; while I received from Assam only *females* of a much darker colour. The Assam *females* are more or less blackish brown, and have often a bluish tint; the white streaks are much reduced in length and breadth; the anal yellow spot is sometimes very small, and such examples resemble *P. leucothoë* Westw.

I do not know why dark *females* alone come from the Khasia Hills; perhaps the native collectors do not catch the white form because it looks like the valueless *male*. If the Assam *females* are all of the dark colour, and the Sikkim and Bhutan *females* of the light colour, *P. xenocles* must be divided into two local races, of which the Assamese one would be typical.

Two *males* from Siam, Burmese frontier, are aberrant in having the submarginal spots of the hindwings more or less obliterated and the anal yellow mark small.

The hairs of the abdominal margin of the hindwings vary from being white to being almost orange yellow.

Hab. North India: Sikkim (8 ♂, 3 ♀), Bhutan (1 ♀), Khasia Hills (4 ♂, 22 ♀); Burma; Tenasserim; Shan States of Siam (3 ♂).

204. *Papilio leucothoë* Westw. [♂, ♀].

Papilio leucothoë Westwood, *Arc. Ent.* II, p. 128. t. 79. f. 3 (♂) (1845) (Penang?); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 265 (1864); Wall., *Tr. Linn. Soc. Lond.* XXV, p. 62. n. 95 (1865); Oberth., *Et. d'Ent.* IV, p. 100. n. 317 (1879) (Malacca); Stauding. & Schatz, *Exot. Schm.* I, p. 6 (1884); Dist., *Rhop. Mal.* p. 356. n. 20. t. 27a. f. 2 (♂), 3 (♀) (1885) (Mal. Pen.).

Papilio xenocles var. *leucothoë*, Gray, *Cat. Lep. Ins. B. M.* I, p. 71. sub n. 327 (1852) ("N. Ind." *loc. err.*; Singapore?).

Three subspecies belong to this *Papilio* :—

(a): **P. leucothoë** Westw., forma typ. [♂, ♀?].

Differs from *P. xenocles* Doubl. chiefly in the absence of the yellow anal spot. The white streaks are very variable in number, length and breadth; those within the cell of the forewings are often entirely absent.

Hab. Malay Peninsula (52 ♂).

The *female* is apparently unknown, though Distant figures a specimen as "*female*"; in my Museum is a *male* from Mr. Distant's collection which so perfectly agrees with the figure of Distant's "*female*," that I have little doubt that this specimen is that figured by Distant; it bears the label "Kuala Lempur (Biggs)." Judging from analogy, the *female* of *P. leucothoë* must be darker than the *male*.

(b): **P. leucothoë interjectus** Honr. [♂, ♀].

Papilio leucothoë, Oberthür (*ur* Westwood, 1845), *Et. d'Ent.* IV. p. 117. n. 317 (1879) (Sumatra).
♂ ♀. *Papilio leucothoë* var. *interjectus* Honrath, *Berl. E. Zeit.* XXXVII. p. 490 (1893) (Palembang, Sumatra); Hagen, *Iris* VII. p. 20. n. 7 (1894) (Sumatra).

Certain examples, chiefly ♂♂, agree with *P. leucothoë*, others, chiefly ♀♀, with *P. leucothoë ramaceus* Westw.

Hab. Sumatra [5 ♂].

(c): **P. leucothoë ramaceus** Westw. [♂, ♀].

Papilio ramaceus Westwood, *Tr. Ent. Soc. Lond.* p. 95. t. 5. f. 3 (♂) (1872) (Borneo); Druce, *P. Z. S.* p. 356. n. 3 (1873) (Borneo).
Papilio schönbergianus Honrath, *Berl. E. Zeit.* XXXII. p. 250. t. 5. f. 4 (♂) (1888) (Borneo).
Papilio leucothoë var. *ramaceus*, Honrath, *l.c.* XXXVII. p. 490 (1893).

The white streaks of the forewings are obliterated, the submarginal spots present but small, often (♀) partly absent; sometimes there is at the hinder angle a rest of the double streak before the submedian vein.

Discal streaks of the hindwings short, often partly, or all (♀), absent.

Hab. Borneo (11 ♂, 1 ♀).

Gray, *Cat. Lep. Ins. B. M.* I. p. 71 (1852), enumerated *P. leucothoë* as a variety of *P. xenocles*; the two species are indeed closely allied, though distinct.

205. **Papilio delesserti** Guér. [♂, ♀].

Papilio delesserti Guériu, *Rev. Zool.* p. 233 (1839) (Penang); *id.*, *l.c.* p. 153 (1842) ("*melanides* De Haan = *delesserti* Guér." *ex err.* pro "*laodocus* De Haan = *delesserti* Guér.") ; *id.*, in Deless., *Sour. Voy. Ind.* II. p. 68. t. 17 (♀) (1843) (Penang); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 20. n. 257 (1846) (Singapore); Gray, *Cat. Lep. Ins. B. M.* I. p. 71. n. 325 (1852) (Singapore); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C. I.* p. 91. n. 185 (1857) (Java?); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 259 (1864) (Penang); Butl., *Tr. Linn. Soc. Lond.* (2), *Zool.* I. p. 552. n. 10 (1877) (Mal. Pen.); Hagen, *Berl. E. Zeit.* XXXVII. p. 155. n. 174 (1892) (Banka I.).
Papilio laodocus De Haan, *Vorb. Nat. Gesch. Ned. overz. bez.* p. 42. t. 8. f. 5 (♂) (1840) (Borneo; Java); Vollenhov., *Tijdschr. v. Ent.* III. p. 88. n. 156 (1860) (Java); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 260. & p. 354. n. 151 (1864) (Java; Malacca; Borneo); Druce, *P. Z. S.* p. 356. n. 1 (1873) (Java); Oberth., *Et. d'Ent.* IV. p. 109. n. 322 (1879) (Borneo); Standing & Schatz, *Exot. Schmett.* I. p. 6 (1884); Honr., *Berl. Ent. Zeit.* XXXVII. p. 158. note 3 (1892); Hagen, *Iris* VII. p. 19. n. 6 (1894) (Sumatra: *albinistic aberr. noticed*).
Papilio dehaani Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 62. n. 94 (1865) (Malacca; Borneo); Dist., *Rhop. Mal.* p. 356 (1885).
Papilio laodocus var. *palawianus* Staudinger, *Iris* II. p. 6 (1889) (Palawan).
♀. *Papilio atoris* Grose Smith, *Linn. Mag. N. H.* (6). X. p. 426 (1892) (Borneo: "♂" *ex err.*).

I cannot see that there are any differences between the specimens from Malay Peninsula, Borneo and Palawan; the examples from each locality vary slightly *inter se*.

The *female*, which is very rare, is much larger than the *male*.

The name of *delesserti* has the priority of date of one year.

Hab. Malay Peninsula (19 ♂); Sumatra (4 ♂); Java; Natuna Islands (1 ♂); Borneo (14 ♂, 3 ♀); Palawan (3 ♂).

b. Abdomen with five white lines, two on each side, and one in the middle of the underside. *Males* with the scent-organ less developed than in *P. macareus*, etc.; abdominal fold short, hairs at its margin also short; no distinct cottony scent-organ within the fold.

206. *Papilio megarus* Westw. [♂, ♀].

Papilio megarus Westwood, *Arc. Ent.* II. p. 98. t. 72. f. 2 (♂) (1815) (Assam); Doubl. Westw. & Hew., *Gen. Diurn. Lep.* I. p. 20. n. 256 (1846); Gray, *Cat. Lep. Ins. B. M.* I. p. 71. n. 326 (1852) (Sylhet); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* I. p. 90. n. 183 (1857) (Sylhet); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 266 (1864); Moore, *P. Z. S.* p. 672 (1867) (Sylhet); id., *l.c.* p. 697 (1878) (Hainan: *ead. spec.?*); id., *l.c.* p. 840 (1878) (Hatsiega); Stauding. & Schatz, *Exot. Schmett.* I. p. 6 (1884); Dist., *Rhop. Mal.* p. 468. t. 42. f. 9 (♂) (1886) (Perak); Holland, *Tr. Amer. Ent. Soc.* XIV. p. 122. n. 72 (1887) (Hainan); Elwes, *Tr. Ent. Soc. Lond.* p. 430. n. 419 (1888) (Sikkim?); Haase, *Unters. üb. Mim.* p. 37 (1893); Oberth., *Et. d'Ent.* XVII. p. 5 (1893) (Tonkin).

Papilio (Parantipopsis) megarus, Elwes & Nicév., *Journ. As. Soc. Beng.* p. 433. n. 124 (1886) (Tavoy & Siam); Nicév., *Gazetteer of Sikkim* p. 173. n. 487 (1894) (occurrence in Sikkim doubtful).

Parantipopsis megarus, Swinhoe, *Tr. Ent. Soc. Lond.* p. 315. n. 411 (1893) (Khasia Hills).

I have to divide this species into two subspecies:

- (a): *P. megarus* Westw. from Assam; Burma; Tenasserim; Malacca; Tonkin; Hainan;
- (b): *P. megarus fleximacula* n. from Banguay Island.

(a): **P. megarus** Westw., forma typ. [♂, ♀].

The *female*, which was hitherto unknown, is similar to the *male*; in my single example of that sex, the spots in the cell of the forewings are merged together to oblique streaks as in *P. macareus* Godart; the discal white markings of the same wings are broader than in the *male*; in these characters the *female* resembles very much an aberrant *male* in my collection ticketed "Sikkim"; this locality is probably erroneous.

Hab. Assam (Khasia Hills: 12 ♂); Sikkim (doubtful); Burma; Shan States (3 ♂); Tenasserim (1 ♀); Perak; Tonkin; Hainan; Borneo (1 ♂).

The Bornean specimen (Kudat; A. Everett *leg.* March 1892) in my collection stands intermediate between this and the next subspecies. Specimens from Perak, Tonkin, and Hainan I have not seen.

(b): **P. megarus fleximacula** subsp. nov. [♂, ♀].

Differs from *P. megarus* in the following points:—

The spots in the cell to the forewings are larger, and shaped almost as in *stratocles* Feld.; a line runs, behind the subcosta, from near the apex of the cell halfway to the base, where it turns round and runs obliquely towards the median nervure, ending on a level with the upper median branch; within the space circumscribed by this anguliform line, which is longer and thinner than in *stratocles*, there is a white streak as in *stratocles*, which is, in the ♀, joined to the line. The two discal spots standing separate in *megarus* between the first and second median nervules are merged together to a long streak. The three anterior submarginal spots are smaller than in *megarus*.

The markings of the hindwings are similar to those of *megarus*, but the submarginal lunules are much thinner.

Note.—The scales of the white markings of *flexinacula* are broader than in *megarus*, but much narrower than in *megaera* Stauding.—K. J.

Hab. Banguay Island (1 ♂, 1 ♀ in coll. Staudinger).

207. *Papilio megaera* Stauding. [♂, ♀].

Papilio megaera Staudinger, *Iris* p. 275 (1888) (Palawan); id., *l.c.* II. p. 8 (1889) (Palawan; var. of *megarus* Westw.?).

Wings much paler brown than in *P. megarus* Westw.; the white markings obliterated in the basal half of the wings.

Hab. Palawan (4 ♂, 1 ♀).

Note.—About the difference in the scaling of *P. megarus* and *megaera* see p. 456.—K. J.

208. *Papilio stratoeles* Feld. [♂, ♀].

Papilio stratoeles Felder, *Wien. Ent. Mon.* V. p. 298. n. 4 (1861) ("Mindanao" *loc. err. according to Semper, l.c.*); id., *Verh. z. b. Ges. Wien* p. 308. n. 263 (1864) (Mindoro); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 63. n. 97 (1865); Stauding, *Iris* II. p. 7 (1889) (Palawan).

Papilio (Chilasa) stratoeles, Semper, *Philipp., Tagfall.* p. 267. n. 390. t. 43. f. 2. 3. 4 (♂). 5 (♀) (1893) (Mindoro; Mindanao; Palawan).

Papilio magicus Staudinger, *Iris* II. p. 7 (1889) (Palawan).

Resembles in pattern *P. macareus* Godart, but belongs to the present section of the *macareus*-group.

Hab. Philippine Islands: Mindanao (1 ♂, *type!*), Mindoro (3 ♂, 2 ♀); Palawan.

209. *Papilio deucalion* Boisid. [♂, ♀].

Papilio deucalion Boisduval, *Spec. Gén. Léop.* I. p. 375. n. 221 (1836) ("Moluques" *loc. err.*); Hew., *Exot. Butt.* II. *Pap.* t. 4. f. 11 (♀) (1859) (Celebes); Feld., *Verh. z. b. Ges. Wien* p. 308. n. 261 (1864) (Celebes); Wall., *Tr. Linn. Soc. Lond.* XXV. p. 62. n. 91 (♂, ♀) (1865) (Macassar; Menado); Stauding, & Schatz, *Exot. Schneitt.* I. p. 6. 20 (1884); Rothsch., *Iris* V. p. 442 (1892) (S.E. Celebes).

The markings of the wings are sometimes more, sometimes less yellowish; the first submarginal spot is often absent from both wings. My *female* and that in the Hewitson collection have the discal markings of the wings rather broader than the *males*.

Hab. Celebes (W. Doherty: S.E. Celebes, August to September 1891) (10 ♂, 1 ♀).

210. *Papilio leucadion* Stauding. [♂].

Papilio leucadion Staudinger, in Staud. & Schatz, *Exot. Schneitt.* I. p. 20. t. 13 (♂) (1884) (Halmahera).

My two specimens agree very well with Staudinger's figure.

Female unknown.

Hab. Halmahera (W. Doherty: August 1892) (1 ♂); Batjan (W. Doherty: March 1892) (1 ♂).

211. *Papilio thule* Wall. [♂, ♀].

Papilio thule Wallace, *Tr. Linn. Soc. Lond.* XXV. p. 63. n. 98. t. 7. f. 1 (♂: right side of fig.) (1865) (New Guinea).

Discoidal cell of forewings with a number of greenish white spots; discal greenish white area divided into spots by the nervules, which are broadly bordered with black.